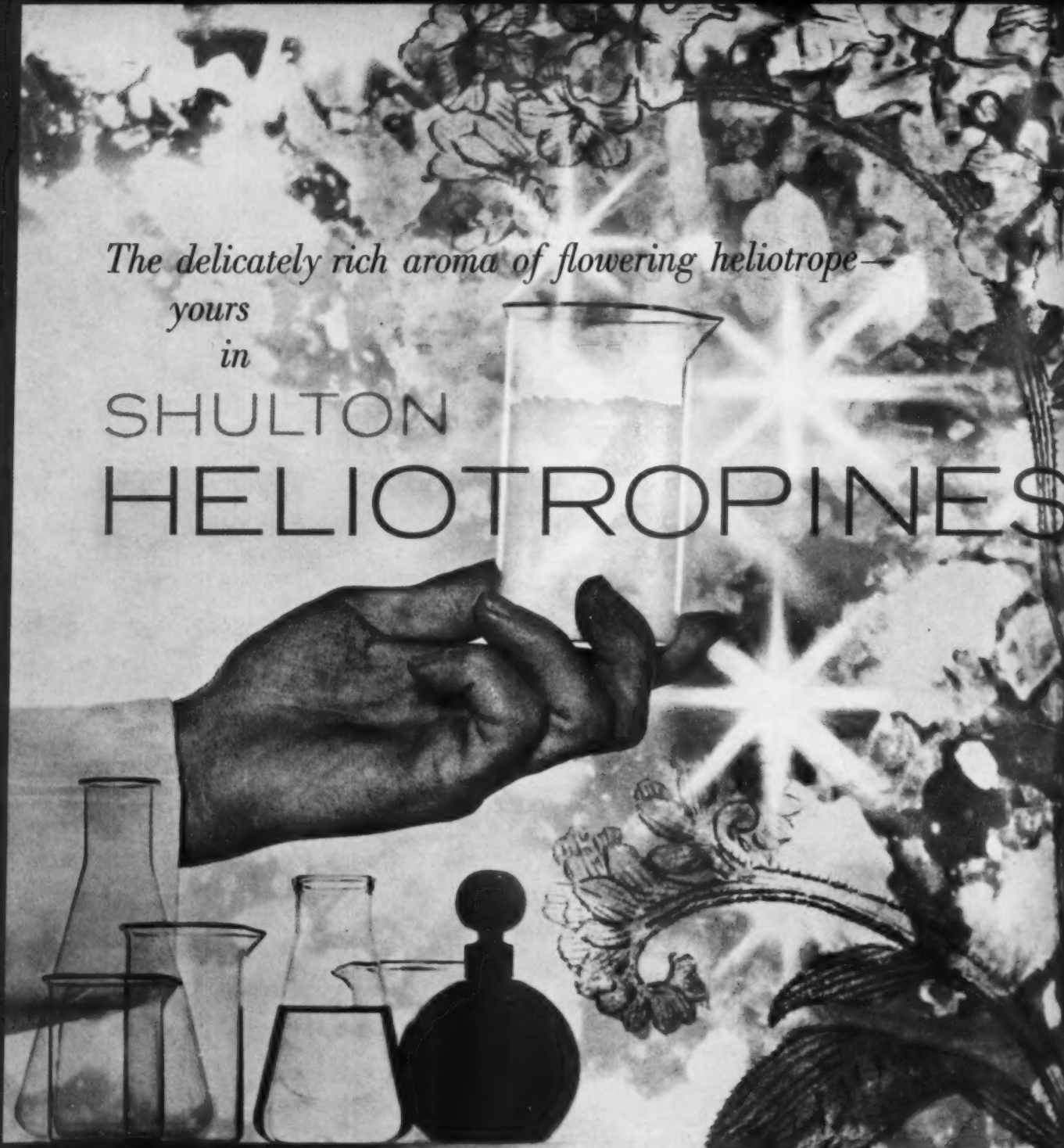


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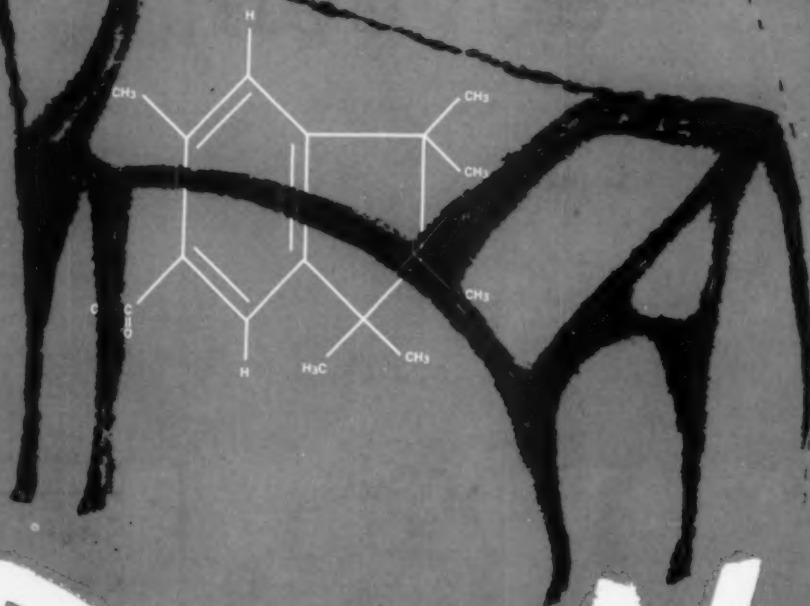
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American Perfumer

VOL. 75, NO. 7

JULY, 1960

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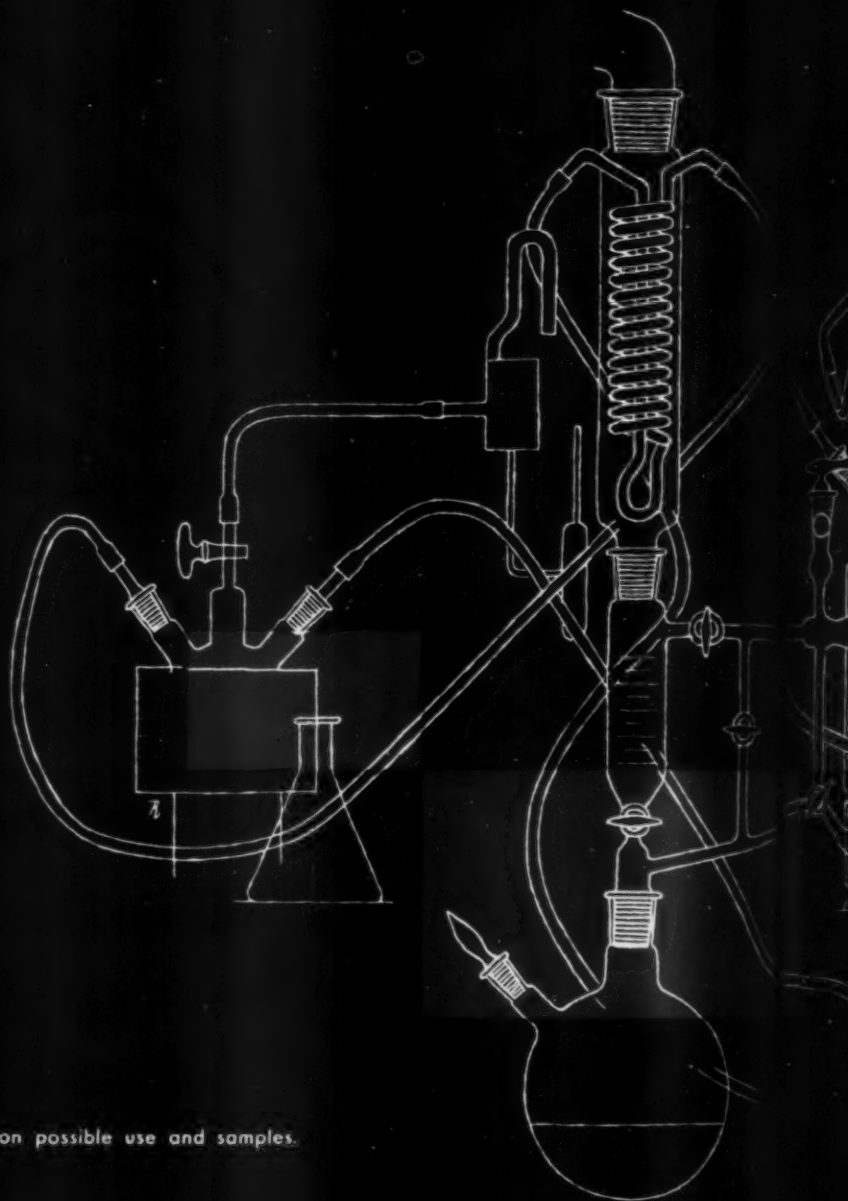
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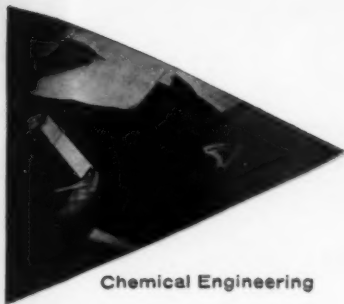
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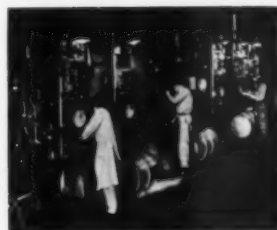
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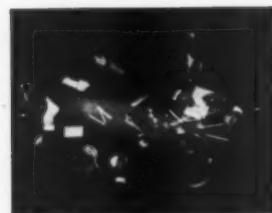
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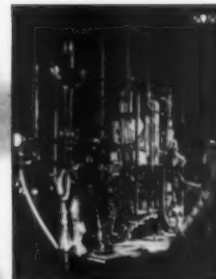
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Questions and Answers

Q. Would you please inform me of the formula of fragrances used to give pharmacies the nostalgic aroma of old times? T. P., Pharmacist, N. J.

A. It is not any one thing that gave pharmacies the nostalgic aroma of old times, but the combination of many. As a pharmacist, we are sure you are aware of the fact that numerous aromatic drugs, thyme and chamomile being the most commonly used ones, were continually being treated with boiling water for the manufacture of decoctions or being extracted with alcohol for the purpose of making tinctures or fluid extracts. The decoctions volatilized some of the aromatic principle, and in the course of producing the various extracts some invariably spilled which in turn blended with the wood to give it a characteristic bouquet. While we have mentioned thyme, numerous other botanicals were also processed and these as a group produced what you refer to as the "nostalgic aroma."

Q. Can you suggest a formula for a "beauty mask" that can be peeled off (as a film) after it is applied and allowed to dry. R. E., California

A. We do not know the compositions of the type of beauty masks to which you refer in your letter. We do know that a natural rubber latex has been used in alkaline mixtures for the purpose outlined in your letter. The film is brushed on and on drying can be removed in a solid strip. These beauty masks have never been too popular, and as a result, there is very little known or published about them. Keep in mind that the latex must be maintained in an alkaline medium otherwise it will precipitate. It would be our guess that about 15 or 20 per cent of latex in a polyol stearate emulsion in which the pH is properly adjusted to a figure somewhere around pH 8, should result in a product to meet your requirements.

Q. Please give us a formula for a roll-on mascara and a liquid eye liner. We have Maison G. deNavarre's, "The Chemistry and Manufacture of Cosmetics" William R. Keithler's "The Formulation of Cosmetics and Cosmetic Specialties" and "Cosmetics: Science and Technology," Edward Sagarin, editor. None of these "cover" the formulas in question. M. C. R., Ohio

A. We do not want you to think that we are trying to duck our responsibility to subscribers. However, if you will think through on the request made in your letter, we think you will realize that you have asked for some very new and very valuable data which is not forthcoming from a trade publication. Roll-on mascara is a result of hundreds of thousands of dollars worth of development work. Unfortunately, we cannot give you any inside information on it since we do not know its composition. It would be our guess, however, that if one started with cake mascara and emulsified the product with a substantial amount of water, you would obtain a composition not too unlike the roll-on mascara to which you refer. Since you have deNavarre's book, we suggest you try Formula No. 209 on page 373 as a type and modify to suit your needs. As to the liquid eye liner, this likewise is a brand new item and as closely as we can tell without analysis, and that we are unable to do for our subscribers, it appears to be an emulsion of pigments with rather fast drying properties and comparatively low total solids. The product this writer has seen has not been oily and therefore your emulsions would undoubtedly be based on gums and self-emulsifying polyol stearates, such as Tegacid or some related material. We are sorry to be so sketchy in our reply but you must realize that these are new items and not very much has been published on them.

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Extracts Of Placenta With Algae

Further impetus is being given to the use of algae extracts in cosmetics by making "active" extractions of "low forms" of algae. Just what is meant by low forms, is not elaborated.

It is claimed that such extracts are particularly effective when blended with placenta. A complex of tremones and other biocatalysts is thus obtained.

Maybe this is all fanciful and maybe not. We already know that placenta extracts increase skin respiration. We also know placenta contains phosphatases—although their relationship to skin vitality is not yet established. Nothing is known of algae extracts beyond the claims made for them. A gum mucilage they do contain. But after refining, any "biocatalysts and trephones" present are probably pretty well lost. Processing live material may produce more potent extracts.

Oh! what a lot of testing and elaboration of analytical methods still remains to be done!

Splitting Of The Finger-Nails

Query—"Is splitting of the finger-nails likely to be due to the use of detergents? The patient is a housewife of 35. Are there any oth-

er likely causes, and what is the best treatment" Reply—"So little is known about the factors which influence nail growth either for good or for ill, that the honest answer to the query is that the cause of splitting nails is unknown. It was certainly a problem before detergents were introduced and there are no published statistics which show that it has become more common in the last fifteen years. Splitting nails occur even in office workers, and the use of a typewriter has been blamed. It does, however, affect women more commonly than men and it may well be that the degreasing and dehydrating effect of soap and water, detergents and other household chemicals is one of the factors responsible. Nail varnish and nail-varnish remover may also damage the nails and their use should be discontinued if the nails are splitting. The old-fashioned nail polish can be substituted and the friction of nail polishing is helpful. In this particular case it would be wise to advise the use of cotton gloves beneath rubber gloves when doing wet work. If there is any associated dryness of the skin, the use of hydrous ointment B.P. liberally applied at night will make the hands feel more comfortable. Numerous

internal remedies have been advocated, such as iron, thyroid, calcium, and, the most recent, gelatin in a dose of 7 g. daily for fifteen weeks, but in my experience they are ineffective. The only internal treatment which I think is of some value is calciferol and if there is no contraindication, such as renal disease, it could be tried. Calciferol tablets, 50,000 international units, 1 tablet twice a day for eight weeks, or 'sterogyl' 600,000 units in an ampoule, given once a week for eight weeks, would be a sufficient dosage." I. B. Sneddon, M.B., F.R.C.P. Thru *The Practitioner*, 184 (1104) 807-808.

Notes

Stecker recently described a new general germicide sold as a mixture of 5,4'-dibromosalicylanilide and 3,5,4'-tribromosalicylanilide. It is said to be effective in concentrations of 0.3 to 0.5 per cent as compared to 1 to 2 per cent of hexachlorophene The death of Dr. Paul Langlois of Charabot leaves a void in the upper ranks of perfumery that will be difficult to fill A patent assigned to the Secretary of Agriculture covers the preparation of dry flavoring from flavor oil, lecithin, mono- and diglycerides and sugar fatty acid

esters in a sugar base A case of acute allergy to orange juice in a patient who has been able to drink it for years, has been reported by Bendersky and Lupas in the May 13th J. A. M. A. . . . Among the several processes used to make polyethylene, is a new one called Agfo A series of halogenated nitroanilines have been screened against *Botrytis* sp. and found effective. The compounds have a low order of mammalian toxicity Congratulations to Fritzsche's Dr. Ernest Guenther on his election as president of the Society for Economic Botany Occasionally someone tells me they are using the Katadyn process for sterilizing water. Apparently sulfate producing bacteria produce sulfide during the processing Carnduff, Eglington, McCrae and Raphael working at the University of Glasgow, chemistry department, have found a new way to make 1,15-pentadecanolide and have established its presence in the root oil of *Angelica archangelica officinalis* Lemieux makes a good point in his lab

notes on the danger existing in mixtures of oxidizing and reducing agents An interesting news-note came to my attention as follows: Fleuroma have moved to a new address on Dreyer Avenue. Now Dreyer and Fleuroma are competitors. So what, you might say. Well—so now there is talk about changing the name of the street.

Cheap vs. Good Medicine

The statement attributed to SKF's Board Chairman Francis Boyer that "in the last analysis . . . constant pressure (*on the pharmacist*) to dispense cheap medicines instead of good medicines" . . . made before the California Pharmaceutical Association, if generic names are used in place of trade names on drugs, isn't necessarily so.

There are a number of good medicines sold by generic names that are cheaper than the trade named product. Let's just cite a few examples: aspirin, phenobarbital,

the corticosteroids, vitamins and antibiotics.

The more important point as this writer sees it is, that trade names describe a standard of quality. And if the prescribing physician likes a particular one in preference to another, it is his prerogative to so indicate on the prescription. Of course this presupposes the doctor does know this standard of quality and hasn't simply been sandbagged by advertising to the point he doesn't know of another brand of the drug involved. Whether the doctor ever compares the effectiveness of one brand to another brand of the same drug involved is an important question. If he hasn't, then he should. And that was what the A. M. A. Council on Pharmacy and Chemistry was to have done for the doctor.

This council is no longer active. How the doctor now gets his information on the effectiveness and safety of generic named drugs vs. trade marked drugs, this writer doesn't know.

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A cold permanent wave based on Thiolic Acid

BY ANATOLE VESTERMAN

First research on permanent cold waving based on Thioglycolic acid was made several years ago.

Goddard and Michaelis (1) showed that Thioglycolic Acid with a pH above 10 rapidly destroys the disulphide bridges in wool, which break down into free sulphydril groups.

Turley and Windans (2) patented the use of Thioglycolic acid as a depilatory.

Harris (3) observed a very important fact: he noticed that breaking of disulphide bridges may be performed at a pH lower than 8. This discovery made it possible to use thioglycolic acid for treating human hair, which could not have been done with too strong alkaline solutions.

McDonough (4) also reported the possibility of breaking disulphide bridges in slightly alkaline solutions.

Structure of hair

For a better understanding of the action on hair of thioglycolic acid, thiolactic acid or similar products, we are going to draw a simplified scheme, thus making clearer the mechanism of hair waving.

The complex structure of hair is not yet wholly explained. These are the main points: hair is made of long keratin molecules, which bear cystine groups. Keratin molecules are linked together by their cystine groups, which create transversal disulphide bridges, giving the hair its stiffness. This structure of hair could be schematically represented as: W-S-S-W.

After washing, the hairs are wound around curlers and tension grows up in them as if a rubber band was rolled up. The hairs are moistened with ammonium thioglycolate and become swollen after a little

while. The product penetrates between the keratin fibres, and breaks down the disulphide bridges, thus making the keratin fibres free and allowing them to slide along one another. They are displaced, and internal tension disappears.

We might compare this to a rubber band wound up around a curler and split lengthwise without unrolling it. The outer part of the spiral was stretched and is going to shrink, while the inner shortened part is going to lengthen. The outer and inner parts of the spiral are going to slide on each other.

Then, the "neutralizer" is applied to the hair. It is an oxidizer as hydrogen peroxide, sodium or potassium bromate, sodium perborate, ammonium persulfate or another oxidizer. The effect is rebuilding of disulphide bridges. As the keratin fibres slid in the first phase, the new disulphide bridges are not linking now the same parts as formerly. The hairs are regaining their former rigidity, but keeping the new shape of a curl that was given to them.

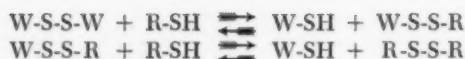
The same thing would exactly happen if the two parts of the rubber spiral were glued together: after taking out the curler, the rubber would keep the shape of a spiral, and resume it if straightened.

Chemical mechanism of hair waving

The chemical mechanism of hair waving is not so simple. It was represented by Reed, Denbeste and Humoller (5):



More recent works by Ross Whitmann and others (6) pointed out that the reaction is separated into two phases, with an intermediate formation of mixed disulphides:



The most widely used cold permanent waving product is Ammonium Thioglycolate with an excess of free ammonia and pH of 9.0 to 9.5.

Together with reduction of disulphide bridges, the alkalinity of the permanent accounts for a hydrolysis reaction:



with a formation of a sulphenic acid group, which is not stable and is oxidized with a formation of sulphinic acid $\text{W-SO}_2\text{H}$ and sulphonie acid $\text{W-SO}_2\text{-OH}$.

These acids are not able to create disulphide bridges by oxidation. If a too strongly alkaline permanent is used, a large amount of sulphinic or sulphonie radicals is formed, and the hairs are destroyed. It is therefore presently advised to make a permanent as weakly alkaline as possible, or even neutral or acid, so as to avoid a hydrolysis reaction. (There are also other reasons to want an acid permanent, but we are not going to linger on this point).

The theory of waving was recently studied by Rosenthal and Oster (7) and by Leberl (8).

Some works on wool fibre give a very different interpretation of these various phenomena and emphasize the importance of hydrogen links. An extensive bibliography may be found in publications by Farnworth (9), Feughelman (10) and Springell (11).

Among specialists in Cosmetics, Walker (12) acknowledges the role played by hydrogen links. Branchhoff (13) and Leberl (8) think that urea, formamide and phenol might break these hydrogen bridges but that their action is not strong enough to make the wave permanent.

It can be seen from what precedes that the action of mercapto-acids on hair is very complex, and its mechanism not yet completely elucidated.

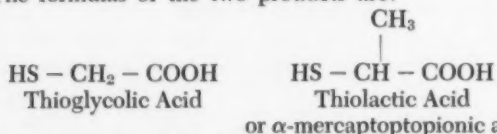
Thioglycolic acid and thiolactic acid

As permanent cold waving based upon thioglycolic acid appeared, it was tried to replace it by other products. We exposed several of these attempts in a former publication (14). Leberl reviewed them all in his work.

Thiolactic acid was tried among these replacement products and is used in France on a small scale. As far as we know, it is not commercialized in another country in Europe or the U.S.A.

From the points of view of chemistry, physics, physiology and application in cold waving, thiolactic acid is very closely related to thioglycolic acid, and it should always be studied comparatively with the latter.

Let us first consider chemical and physical facts. The formulas of the two products are:



The formula of thiolactic acid is written in an unusual way, so as to bring out its resemblance to Thioglycolic acid, the only difference being a lateral methyl group.

Physical and chemical characteristics of both acids are very similar (15)

<u>Thioglycolic Acid</u>	<u>Thiolactic Acid</u>
Boiling point	Boiling point
102.5° to 103° (under 13 mm)	102° (under 16 mm)
Dissociation constant:	Dissociation constant:
$K_1 \dots 2.1 \times 10^{-4}$	$K_1 \dots 2.0 \times 10^{-4}$
$K_2 \dots 2.0 \times 10^{-11}$	$K_2 \dots 2.0 \times 10^{-11}$

Thiolactic acid was first prepared by Schacht (16). Several workers made it afterwards using different methods. See publications by Biilmann (17), Martin (18), Fraser (19), Larsson (20), Bernton (21), Loven (22).

Comparative efficiency

Morelle (23) described the use of thiolactic acid in permanent cold waving. It is used as ammonium thiolactate, in a 9.5% concentration for hard hair or 7.4% for dyed hair. Just as for ammonium thioglycolate, the pH is kept at 9.5.

According to Morelle, ammonium thioglycolate induces 300% hair swelling and ammonium thiolactate only 10%. This statement by Morelle is reproduced by Walker (24) but challenged by Heilingotter (25). A photograph by Ralph L. Evans is shown by Morelle as an evidence of the strong swelling of hair by thioglycolic acid. This picture shows hair swelling up to 270% after staying 12.75 minutes in a 4% ammonium thioglycolate solution at a pH 12.5. But in cold waving a pH of 9-9.5 is used, and it is not surprising that strong swelling occurs at a pH of 12.5. At such a high pH the product is not a permanent wave but a depilatory.

Heilingotter states that at a normal pH of 9 to 9.5 hair swelling in ammonium thioglycolate is the same as in ammonium thiolactate.

According to Walker (loc. cit.), waving is much slower with Thiolactic Acid than with Thioglycolic Acid, although the solution used is more concentrated. For instance 10% ammonium thiolactate at a pH of 9.5 waves hair in 30 minutes, while 7% Ammonium thioglycolate at a pH of 9.5 gives the same waving in less than 10 minutes.

Thiolactic acid attacks keratin less and does not have a depilatory effect even at a very high pH, as well in an alkaline salt form, as in a calcium salt. It also attacks skin less. About these facts, see publications by Walker (26).

Morelle (23) considers that Thiolactic acid is weaker than Thioglycolic acid and forms less ionized salts, and this would explain its lower efficiency.

This explanation is not quite satisfactory. As told above, both acids have identical dissociation constants, and may be considered as equivalent. This is rather logical, both acids having their active groups, carboxyle and sulphhydryle, at the same distance, with a single carbon between them.

It is therefore necessary to look for another explanation of the weak activity of thiolactic acid. It is more polarized, containing an asymmetrical carbon. It may be assumed that thiolactic acid has less affinity for keratin and this could explain the poor swelling of hair noticed by Morelle. The latter phenomenon meaning that Thiolactic acid penetrates slowly and

poorly between keratin fibers, allowing only a slow attack of the disulphide links of keratin, this could explain the too slow waving produced by thiolactic acid.

Anyway, this too slow activity of thiolactic acid makes its practical use difficult, when the "hairdresser's working speed" factor is very important.

Thiolactic acid is more expensive than Thioglycolic acid, the more so as a higher concentration is needed; slower waving also increases the cost of labour. All these factors have a contrary influence on the development of Thiolactic acid in hair waving.

H. Schwarzkopf (27) described in a recent patent a cold wave based on Ammonium Thiolactate, Sodium cysteinate and ammonium sulphite, resulting in a good waving, with a better smell. In a mixed permanent of this kind, it is difficult to know the part exactly played by each ingredient, and what would be the activity and odor of the mixture with Thioglycolic acid instead of Thiolactic acid. Parco Cy Inc. (28) is using for the unwaving of hair 8% Thioglycolic acid or 12% Thiolactic acid, because of the higher molecular weight of the latter.

Comparative toxicity

The last question is the comparative toxicity of Thiolactic and Thioglycolic acids. A great many workers have studied this problem and an extensive literature may be found on this subject. We exposed it several times already (29).

The main works on toxicity of Thioglycolic acid may be summed up as follows:

- Experiments on injection to animals showed a fairly high sensitivity, but lethal doses varied considerably according to different authors. We are going to resume this point a little further.
- Experiments on application of the product to the skin of animals gave negative results, at the utmost a slight irritation.
- Experiments on human beings with ammonium thioglycolate compresses gave negative results in the majority of cases, as well in healthy persons as in persons suffering from a skin disease; cases of irritation of the skin or eczema were rare.
- Hairdressers who are ceaselessly in contact with ammonium thioglycolate are often working without taking elementary precautions. Shops are often not well aerated, and a few cases of skin irritation or other dermatological conditions have been reported.
- Cases of skin irritation are rare among customers who have a permanent 2 to 4 times in a year; according to a recent statistic made in the U. S., reported cases were only 0.01%.

A conspicuous fact is that between 1942 and 1950 several workers pointed out the toxicity of thioglycolic acid in experiments on human skin or in the practical use as a permanent. In the later period after 1950, publications on this subject became more rare, and almost all workers concluded that the risk of toxicity is very low with a normally handled permanent.

We think that the practical experience of various countries where about one billion permanents have been made, showed that the risk is very small, and

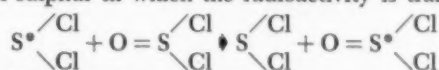
that experiments on a laboratory scale have lost any interest in front of this evidence.

Manufacturing of the product has been also improving, and a purer ammonium thioglycolate is now delivered, free from by-products which had proved more toxic than thioglycolic acid itself. Moreover, hairdressers gained experience and know better how to use the product.

It would be too long to list a complete bibliography on the subject; let us only mention recent works by Smidt (30), Borelli (31) and Fritjoff (32).

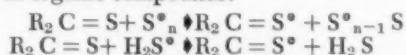
Freeman and Coll. (33) made experiments on animals with thioglycolic acid bearing a radioactive isotope Sulphur 35, and observed elimination of sulphur in urine, and radioactivity in different organs. We are not going to argue about the interest of this work, but deductions made from such observations should be very careful. Sulphur gives very often interchange reactions, which often occurs between two products containing this element. If a product contains marked sulphur and another one ordinary sulphur, it can be noted after a certain lapse of time that the second product is also becoming radioactive.

Several publications have appeared on this subject. Muxart (34) noted the following reaction with mineral sulphur in which the radioactivity is transferred:



*Radioactivity (S^{35})

Brodsky and Miklukhin (35) studied interchange reaction in organic compounds:



Marked thioglycolic acid is going to meet other sulphur compounds normally present in the animal's body, and Sulphur 35 is partially going to pass into these compounds. A control of the different organs is going to show radioactivity, but this does not really come from thioglycolic acid. In such circumstances, experiments with radioactive sulphur must be considered very cautiously.

Toxicity of thiolactic acid has not been so extensively investigated, and it has been mostly compared to thioglycolic acid. Morelle (36) examined the question thoroughly and came to the conclusion that thiolactic acid is much less toxic than thioglycolic acid.

We do not agree with several conclusions of Morelle.

Fairly old publications by Hill (37), Cohen (38), Draize (39), Kensler (40), showed that the lethal dose of thioglycolic acid for animals varies greatly from 100 to 625 mg/kg. In a more recent work, Wellers (41) found the lethal dose in intraperitoneal injection to rats and mice to be 500 mg/kg. With thiolactic acid, according to Petithory (42) and Hill (loc. cit.) the lethal dose varies from 735 to 796 mg/kg. In identical experimental conditions, Wellers (loc. cit.) finds a lethal dose of 600 mg/kg.

Schuster and Coll. (43) published an exhaustive study on toxicity and blood sugar levels in rabbits which ingested 200 mg/kg and 400 mg/kg freshly prepared and distilled ammonium thiolactate, with a neutral pH. Rabbits which received 200 mg/kg thiolactic acid exhibited "epileptiform crises"; in four rabbits with a dose of 400 mg/kg thiolactic acid, death

resulted in "insulinic coma". Unfortunately, Schuster and Coll. did not make any comparative experiments with thioglycolic acid.

In conclusion, our opinion is not the same as Morelle's and we consider that thiolactic acid is as toxic as thioglycolic acid.

In our publication (loc. cit.), we pointed out the necessity of well purifying thioglycolic acid and eliminating dithiodiglycolic acid which is formed during industrial preparation. The latter acid, if not eliminated, is decomposed according to Schoberl's cycle (44) with a formation of sulphenic and oxalic acids, which are toxic. This fact is another argument for Morelle to prove the toxicity of thioglycolic acid, if it is transformed into Dithiodiglycolic acid at the moment of its use. This is not an exact interpretation of our opinion. Dithiodiglycolic acid is much less toxic than thioglycolic acid; the danger that we exposed only exists after a prolonged storage of the permanent, as a slow decomposition and formation of toxic products take place. Whereas if a well purified permanent is used, the dithiodiglycolic acid which is formed is rapidly eliminated, before being decomposed or transformed into toxic products.

Thiolactic acid is also transformed into Dithiodilactic acid, which has to follow a cycle similar to Schoberl's.

We can see from this that thiolactic acid has the same disadvantages as thioglycolic acid, the same degree of toxicity, but is slower working and is more expensive.

One could wonder why thiolactic acid was launched industrially in France as a cold permanent.

From beginning of the use of thioglycolic acid as a cold permanent, followers and opponents discussed this method with animation. According to Welker (39), French technicians exaggerated the toxicity of thioglycolic acid.

The French government authorized in a decree of 1949 the use of thioglycolic acid by hairdressers, in a concentration not higher than 8%. But it was prohibited to sell thioglycolic acid to private people for home permanents. Switzerland followed the procedure of France and prohibited also the public sale of Thioglycolic acid.

Presently 300,000 permanents are made every month in France.

After several years of experience showing the harmlessness of Thioglycolic acid permanents, the Federal Council of Switzerland abolished these restrictions.

In France, The Superior Council of Public Hygiene in July 1956, and the National Academy of Medicine in March 1957, recommended the free sale of ammonium thioglycolate. The official powers did not follow this recommendation, and the public sale of a cold permanent based on thioglycolic acid is still prohibited.

Thiolactic acid escaped this legislation in France and its public sale is unrestricted. This is the main reason for the commercial launching of this product in France.

In spite of this freedom, the cold permanent based on thiolactic acid is still expensive and it is not developing on a large scale.

Conclusion

Thiolactic acid is similar to thioglycolic acid, and may very well be used as a cold permanent wave. It has to be used at the same pH as thioglycolic acid, but in a slightly higher concentration. A fine waving is achieved, but it takes more time.

Thiolactic acid cannot be used as a depilatory.

Thiolactic acid has the same toxicity as thioglycolic acid.

A higher cost price and a longer waving time hindered the commercial development of this product in different countries.

French legislation is prohibiting the public sale of thioglycolic acid and granting its use to professional people only. The public sale of thiolactic acid is free and this explains the launching in France of this product, with a still low selling rate.

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Lanolin Derivatives

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The unctuous substance, familiarly known as lanolin, featured in the labels and advertisements of many nationally popular cosmetics, is a product of nature that has been extensively used in such preparations since 1882. During its long history lanolin has proven to be not only an excellent and innocuous skin lubricant but also one of the best w/o emulsifiers and stabilizers available.

Lanolin is a complex mixture of chemical compounds. Many of its components can be and are separated or transformed to materials more versatile and useful than their parent product. The more important lanolin derivatives, many of which are developments of recent years, are briefly discussed.

Lanolin Alcohols

The first lanolin derivatives to appear on the market, were those obtained by hydrolysis or, what may be termed, a vertical split of lanolin. The alcohols, which constitute about 50% of lanolin, were separated from the saponified acids, by solvent extraction, the lanolic acids being subsequently recovered by acid-splitting the soap. The alcohols are mainly used as a starting point in the manufacture of cosmetic absorption bases and, to some extent, as a source for cholesterol in the synthesis of steroid hormones.

Absorption Bases

The unsaponifiable fraction of lanolin, consisting of a mixture of monohydric alcohols, upon dilution with mineral hydrocarbons, exhibits water-absorbing and water-holding properties superior to those of lanolin.

It was discovered that the more polar alcohols, which can be selectively separated from the unsaponifiable fraction by solvent recrystallization, are the principal source of emulsifying power. In combination with selected lanolin esters dispersed in a suitable mineral hydrocarbon vehicle, these particular alcohols form emollient bases that promote rapid emulsification and, in conjunction with water, yield white, stable emulsions with pleasing cosmetic effects. The modern ab-

sorption bases, now widely used, resulted from these developments.

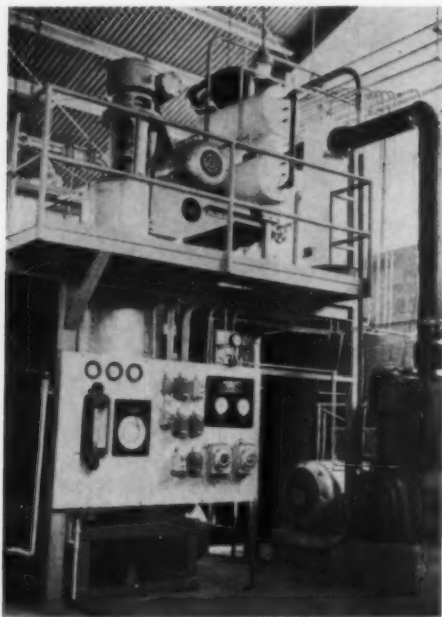
The uniformity of chemical composition and physical properties of its raw materials are of prime importance to the cosmetic industry. Absorption bases possess these desirable characteristics to a much greater degree than lanolin. They simplify the formulation and manufacture of cosmetic emulsions by reducing the number of ingredients and manufacturing steps necessary to make such preparations. In certain instances, suitable cosmetic products may be obtained simply by melting, adding water and mixing. Absorption base emulsions remain notably free from the surface yellowing that inevitably develops in high lanolin content creams. Absorption bases are principally used to manufacture all-purpose creams, hormone creams, cream hair oils, hand lotions and, to a lesser extent, in shaving preparations.

Lanolic Acid Compounds

The lanolic acids, recovered from the hydrolysis products of lanolin until recent years were of minor importance. They possess a pungent odor reminiscent of limburger cheese and their use was largely limited to such products as metallic lanolates which find use principally as film-fortifying agents in special industrial coatings. In Europe, water-soluble products, useful as wetting agents and detergents, have been prepared by sulfonation of the lanolic acids and alcohols in the presence of phenol. More recently alkyl amines, soluble in mineral hydrocarbons, and useful as foaming agents and mild detergents, for the preparation of clear liquid and gel-type shampoos have also been developed.

Lanolic Acid Condensates

Certain amine condensates of selected lanolic acids, because of their waxy nature, various degrees of hardness and plasticity, and solubilizing effect upon bromo-acids, possess properties of possible interest to the lipstick industry. These amides may be produced by ester interchange involving the reaction of 1 mole



High vacuum fractional distillation unit.

of the lanolic acid methyl ester with 1 mole of an amine under proper conditions resulting in a product with a true amide content above 90%. By adapting these amides to modern formulation requirements, lipsticks with improved staining and spreading properties may be obtained. These products, now under development, may become commercially available during the coming year.

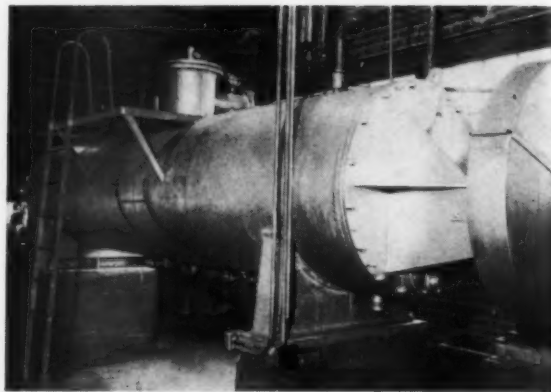
The ethylene oxide condensates of lanolic acids are nonionic surfactants. Condensates, containing limited amounts of ethylene oxide, are good emulsifiers for viscous oils and tend to form w/o emulsions. Condensates having greater amounts of added ethylene oxide, are better emulsifiers but form o/w systems. These condensates are compatible with anionic, cationic and other nonionic compounds.

Fractionated Lanolins

The world's first commercial production of the so-called "dewaxed" and "deoiled" forms of lanolin, was undertaken by an American lanolin producer in 1946. Actually these products are fractions resulting from the horizontal splitting of lanolin by solvent crystallization or high vacuum fractional distillation. Two distinct types are obtained:

1) A liquid lanolin, composed of the low molecular weight lanolic acid esters, whose most outstanding and useful property is oil solubility. Stable binary and ternary systems may be prepared, in various concentrations and ratios, with mineral oil and/or castor oil, that have wide adaptability in cosmetic formulations.

Liquid lanolin can be substituted for ordinary lanolin in many formulations. The result is usually an improvement in the functional properties of the finished product. Liquid lanolins are considered more effective emollients. The removal of waxy esters eliminates stickiness and improves skin softening, penetrating and spreading properties. Liquid lanolins are principally used in hair dressings, baby oils, hand



Rotary extractor for lanolin alcohols.

creams and lotions, various types of anhydrous liquid preparations, particularly in the aerosol field.

2) A hard, waxy fraction composed of the high molecular weight lanolin esters, with a melting point range of 50°/60°C, sometimes described as "deoiled" lanolin, possesses a degree of hardness and plasticity somewhat similar to that of beeswax. Because of its ceraceous nature, this fraction is suggested for use in lipsticks, pomades, leather dressings and polishes, crayons and ski waxes.

Modified Lanolins

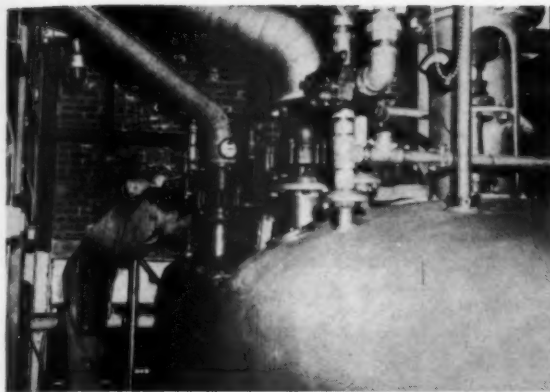
The chemical structure and physical properties of lanolin and its fractions are modifiable by various means including acylation, ethoxylation, hydrogenation and transesterification. Descriptions of such processes appear in the foreign patent literature dating back to 1928.

Acylated Lanolins

It is questionable whether acylating lanolin, by reacting it with acetic anhydride, or a similar acid, improves its functional properties sufficiently to justify such modification. True, oil solubility is improved somewhat (from about 1% to perhaps 10%) but other forms of lanolin are available at lower cost, that are completely oil soluble. Moreover these particular forms of modified lanolins are liquids and, since spreading properties are enhanced by flow, they are superior in this respect not only to lanolin but also to its acetylated form, both of which are solid masses at room temperature. What is perhaps more important, the hydrophylic properties of lanolin are completely destroyed.

Why acetylate lanolin? It is said that the hydroxyl groups in lanolin are a potential source of skin sensitization. Acetylation is said to neutralize the hydroxyl groups of the lanolin hydroxy-esters and the resulting product is claimed to be "hypoallergenic as compared to lanolin." The inference that lanolin is allergenic, is likely to be misleading.

Is lanolin allergenic? Substantial evidence exists to the contrary. In an article by M. B. Sulzberger et al. (Jour. Invest. Dermatol. 20, pp. 33 to 43, 1953), titled "Studies of Skin Hypersensitivity", it is reported that of one thousand forty-eight dermatologic patients with known or suspected skin diseases, only twelve showed positive reactions to lanolin patch tests. In contrast,



Esterification reactors.

not a single positive reaction was encountered in one hundred twenty apparently healthy subjects investigated. In another article by the same author, (*Jour. Invest. Dermatol.* 15, pp. 453-8, 1950) it is stated that: "allergic eczematous contact-type sensitivity to lanolin occurs surprisingly rarely when one takes into account the multitudinous exposures of millions of persons to this substance."

Ethoxylated Lanolins

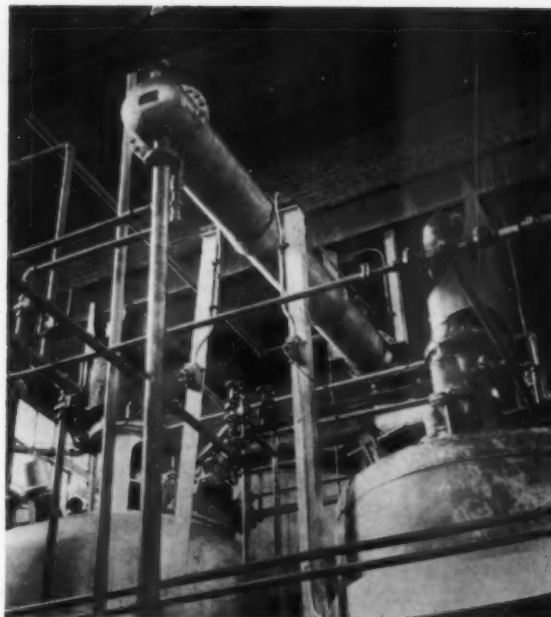
Water-soluble forms of lanolin are obtained by reacting it with ethylene oxide, thus forming a polyoxyethylene chain. A side reaction takes place simultaneously causing hydrolysis of the lanolin esters and formation of polyoxyethylene glycol ethers of lanolin alcohols. The degree of water solubility of the adduct is determined by the molecular proportion of ethylene oxide absorbed by the lanolin.

There are also available a group of alcoholysis products of lanolin and sorbitan polyoxyethylene ethers obtained by reacting lanolin with a polyoxyethylene ether of sorbitol in the presence of sodium hydroxide. These products possess various degrees of solubility or dispersibility in water and may be used as primary or auxiliary o/w emulsifiers.

Ethoxylated lanolins are nonionic surfactants, and possess, 1) excellent stability to hard water, 2) resistance to wide pH and temperature ranges and, 3) compatibility with anionic, cationic and nonionic agents. They function as dispersants, solubilizers, wetting agents or emulsifiers depending upon use but their outstanding property is water-solubility even at relatively low temperatures. They impart emollience in aqueous form and are particularly effective in shampoos, hair conditioners, shaving creams, germicidal hand soaps, household detergents and similar preparations.

Hydrogenated Lanolins

The catalytic hydrogenation of lanolin, which proceeds by methods similar to those employed for hydrogenating fats, was investigated in Japan about 25 years ago. Limited quantities became commercially available from an Italian source recently (1953). Hydrogenation of lanolin modifies its chemical structure and physical characteristics. The reaction proceeds in two stages. First, the unsaturated alcohols become saturated. In the second stage, the ester



Lanolin ester department.

linkages are split and the liberated acids are converted to their corresponding alcohols. Theoretically this reaction, if continued to completion should reduce iodine, acid and saponification values to zero. These optimum levels, however, are unattainable in actual practice. The lowest iodine value obtained during experimental work in our laboratory was 10 (Hanus). The melting point range increases about ten degrees (from 38/40°C to 48/50°C).

The resulting product is an almost odorless, white, waxy, material which, upon aging, may tend towards discoloration and development of odor. The emulsifying power of hydrogenated material appears to be about equal to that of unaltered lanolin.

The pressure hydrogenation of lanolin on a volume basis presents difficult engineering and cost problems. Lanolin does not readily respond to hydrogenation under conditions normally employed for glyceride fats. Exceedingly high pressures (above 4000 psi) and high temperatures (above 500°F) are necessary. The high operating pressures required, limit the size of the autoclaves to comparatively small units, necessitating the installation of a large number of such units to provide adequate production capacity. This not only increases equipment costs but also manufacturing cost to prohibitively high levels. A continuous process for hydrogenating lanolin, employing small diameter, less costly equipment, now under investigation, may prove to be the answer.

Transesterified Lanolins

The partial transesterification of lanolin with low molecular weight alcohols on a commercial basis, is a recent and important development of an American lanolin refiner. Partial transesterification is accomplished by reacting lanolin with an excess of alcohol at its boiling point in the presence of a catalyst such as sodium methylate. During refluxing, the vaporized alcohol displaces air in the reactor and protects the

lanolin compounds against oxidation. By selecting, from the group of lower, saturated aliphatic alcohols (methyl, ethyl, propyl, isopropyl, butyl, etc.), the appropriate reactant, a series of transesterified lanolins can be made with a range and variety of chemical and physical properties. These products provide greater flexibility in formulation not available heretofore to the cosmetic chemist. An important characteristic of the transesterified lanolins are their relatively low iodine values.

Transesterified lanolins possess, to a limited degree, certain characteristics derived from the particular alcohol with which they have been coupled. Their dual emollient/solvent nature imparts more effective emollience and better spreading and penetrating properties. These derivatives thus facilitate the formulation of unique cosmetic preparations with superior functional properties. They are especially suitable additives for aerosol packaged cosmetics, particularly hair sprays, for they solubilize PVP-alcohol concentrates, increase plasticity of their films and impart sheen to the hair.

Lanolin Sols

Lanolin sols that make possible the preparation of

The categories listed below follow the author's headings. The trade names given are examples of products that fall into these categories. The list is not a complete one. The Editors and not the Author compiled these data to make the text more meaningful in terms of commercial materials.

Editors

Lanolin Alcohols

Ceralan
Dusoran
Dohren Wool Alcohols
Golden Dawn Alcohols
Hartolan
Lanethyl
Nimco Wool Alcohols

Absorption Bases

Alcolan
Amerchol
Cremba
Falba
Isocrema
Iso-lan
Hydrophil
Sorbitex
Protegin X

Lanolin Acid Amines & Amides

Lanamine
Lanamid

"Dewaxed" Lanolin (liquid lanolin)

Dusoline
Fluilan
Lanogene
Lanomol
Lantrol
Vigilin
Viscolan

stable, anhydrous, liquid systems in conjunction with mineral oil, became commercially available in 1954. These products basically consist of lanolin dispersed in a lanolin ester vehicle that has chemical and physical affinity for lanolin and fluidizes it. Sols containing approximately 60% of unaltered lanolin are available. Colloidal suspensions are obtained by mechanically mixing these sols with mineral oil. Stable, free-flowing liquids are thus formed with an attractive opalescent appearance, that are superb emollients.

Conclusion

This is not intended to be, and obviously is not, a scientific treatise or definitive review of all lanolin derivatives available from all sources. It is more in the nature of a "cracker barrel" discussion of those types or groups considered most interesting or useful by the writer. It should be noted, however, that in addition to the products described herein, other forms of lanolin derivatives or compounds are available, such as the lanolin alcohol esters of various vegetable fatty acids and lanolic acid esters of various low, saturated aliphatic alcohols, some of which may perhaps be as useful or as effective for certain purposes as some of the products reviewed.

Liquid Lanolin "Extracts"

Amerchol L-101
Liquilan
Nimlesterol

Lanolin "Wax" (oil-free lanolin)

Lanfrax
Lanocerin
Lanodur
Lanowax
Lanwax 120
Waxalan

Lanolin "Sols"

Lanosol

Hydrogenated Lanolin

Hydrolan
Lanalcol
Lanidrol
Lanocerina
Lipocerina

Ethoxylated Lanolin & Derivatives

Atlas G-1425, G-1441, G-1471, G-1790
Ethoxylan
Lanidrol
Lanogels
Lantox
Solam
Solulans

Lanolin Esters

Acetulan
Butylan
Crestalan
Ethylan
Isopropylan
Lipocerina
Modulan
Polylan
Ricilan
Sucrolan

Microscopic examinations on hair colouring

(A dye theoretic view)

BY SIEGFRIED PREISINGER

In the course of the past 2 to 3 decennia the change in colour, the beautifying and the rejuvenescence of the hair have developed in the frame of the cosmetics, or as a part thereof, to a fairly important scope. Historically seen, hair colouring goes back to the beginning of the cosmetics but its real expansion only took place in direct dependence of the progress in the coloristic and in the textile treatment and therefore hair colouring is first of all a technical problem. Thus it was obvious to believe that it would only be necessary for the hairdye chemist and the hairdye operator to follow only the same technique of the textile dyer in order to dye human hairs in all shades as it is done to-day with best results on the morphological related animal hairs, particularly on wool. This is perhaps the reason why we have up to now no real hairdye theory and that in the literature on hair colouring the empirism scores nearly completely off the basic research. Evidently these brief explications of the dye processes on human hairs very little considered the fact that the conditions to dye hairs on living individuals are basically different from the methods to dye wool or even furs and that consequently wool dye stuffs and also several fur dye stuffs are not used in colouring human hairs respectively that they only play an unimportant role. Obviously one considered too little that on hair colouring only particularly mobile, small molecular, keratine affine products penetrate the hair in such a way that one can renounce at aggressive pretreatments, too long times to act and high temperatures. And therefore one was only too much inclined to take over unchecked the conclusions resulting out

of the examinations of the textile dyer or to be content at all with the so easy, clear and oldest mechanic dye theory of Hellot and Dufay originating from the first half of the 18th century. According to this theory the pores of the hair open in a hot dye bath in such a manner that the dyestuff particles penetrate the fibre where they are held fast "like a diamond in the holder of a ring".

For hair colouring this view was later changed in this sense, that the scales of the cuticula which are said to lie absolutely thick one upon the other, are at first spread off by the alkalinity of the dye liquor, and that the dyeing particles have then an access to fine pores and channels under the scale cover. Through these channels the little molecular dye components which are still partly colourless penetrate deeply the interior of the hair—which is indeed a fact—where they join them by oxidation under assistance of oxygen to big molecular coloured formations. The ability to stand the rinse of such a dye will then be made plausible through the fact that these dye complexes develop pigmentlike especially in the hollows of the hair, which are caught there like a mouse that has fed too much. The dye complexes remain there completely captured like in a trap by reclosing of the scales due to the acid rinse of the hair.

Now it was realized that these simple and antiquated views did not explain sufficiently the complicated chemical-physical processes when absorbing and developing oxidation dye stuffs together with the advancing of direct dyeing dyestuffs (mostly nitrated derivatives of the phenylen diamines). These views were not only contrary to many an experience of a skilled hair-dyer but also to the result when regarding dyed hairs under the microscope. They also knew nothing about the chemical-physical states and events

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in macromolecular systems, the adsorption, absorption, change of place theory ("Platzwechseltheorie"), etc.

Due to the rapid development of the cosmetics and the involved increased demands on the research chemist the lack of well-established scientific fundaments on hair colouring became more and more evident, and I believe that at present many people are engaged in pushing ahead the basic research on the hair dye field through various methods of a chemical, histological or physical nature and to open in such a way the view on new developing possibilities. We also followed microscopical examination methods and tried to create—through new adequate preparation methods—the suppositions for an unhindered observation and a photographic and kinematographic documentation of the dyeing processes in each phase of its successive running.

The micro-preparative methods followed as well as initial evaluations of the picture and film material have already been published (1, 2), and I would avoid repeating myself too much before this forum. Allow me, however, the hint that a big part of the elaborations has been carried out in conjunction with the "Institut für Mikroskopie, Mikrofotografie und Mikrokineematografie der Fraunhofer-Gesellschaft" in Mannheim. The Director of this Institute, Herr Dr. habil. Reumuth, has given us valuable suggestions and has placed at our disposal the modern equipment of his Institute in completion of our own microscopical and photographic equipment Carl Zeiss. In addition he supported our task considerably by a temporary placing at our disposal of his assistant, Herr Dräger.

It is my wish to tell you now some observations which seemed to me to be important by showing you some microphotos and a short filmlet which originally was not destined for demonstration purposes but only for scientific evaluations, and to draw therefrom the possible or probable dye theoretic conclusions.

When at the beginning of a dye process the fibre comes into contact with the dye solution we have a clear heterogeneous system solid-liquid. A reaction between the hair and the dye liquor could only take place on the phase interface. But due to its inner structure the hair is able to absorb very quickly solvents and to swell strongly. Thus the touching surface of the two phases becomes visibly greater. The number of the fibre molecules which can react with the dissolved dyestuff molecules, increases constantly till the end of the swelling process. Due to the special macromolecular structure of the keratine fibre it can be supposed that this surface enlargement can be favoured by splitting up the organic salt compounds, by the dissolving of the cystin bridges and finally by arising of fractures in the polypeptid-chains.

With the subsequent dye process the following alternative effects between keratine fibre and dye stuff can be taken in account:

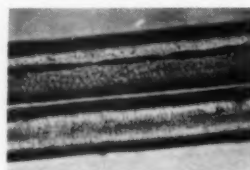
- 1—Pure adsorption of the dyestuff molecules, and one can think of secondary valence strengths, of van der Waal strengths and also perhaps of hydrogen bridge compounds.
- 2—Salt compounds between the ionogenic side chains of the polypeptides and the dyestuff ions. In the manufacture of Hair-Dyes are used until now in

the first instance only the acid amino-acids on the one side and basic dyestuff cations on the other side.

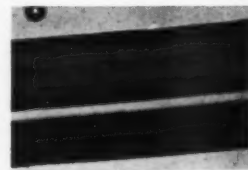
- 3—Other chemical linkages between keratin and dyestuff which are absolutely probable due to the multiple coupling possibilities.
- 4—Pure dynamic dissolution of the dyestuff in the keratin gel, a process which is finished not earlier than until a determined balance between the absorbed dyestuff and the dyestuff being still in solution is obtained.
- 5—Superposition of the one and the other or of all processes by which the examinations become substantially complicated and by which the theoretical conclusions depend eventually on the test conditions.

At first we have examined the dyeing behaviour of a single white hair shaft of a greyed woman's hair. Because of the big difference which often exists between the roots and the lengths of the hair we took care that these two parts could be observed simultaneously. As expected the dyeing of the points took place more rapid and deeper. According to the imagination of many experts which nowadays is still existing, this is due to the porosity of the outer layer of the "worn out" hair part. For this reason the test was repeated with a similar product. At first, however, the scale layer and partially the outer bark layer of the root hairs were removed by erasing off with a razor blade so that the dye liquor could act immediately on the fibre cells. In spite of this treatment the dyeing process did not run in another way than with the first test. This means, however, that for the result of a hair dyeing the morphological building and the state of the fibre play by far not so important a role than other changes of the state to which the hair is exposed in the course of the "wearing out".

Normal dyeing of a hair shaft with oxydation Hair Dye
Picture's scale 200:1



Root and point of a hair (dry preparation)



The same preparation after 20 minutes acting time of the dye.

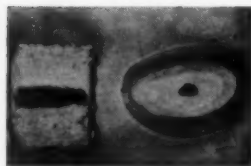
One must suppose that the affinity of the hair increases constantly in the course of the progressive keratinage and the growing older and that this is the consequence of the growing of reactive groups in the hair. Later we will still have an opportunity to explain in a more detailed manner the influences which increase the dyeing ability of the hair.

When considering microscopically a hair shaft and any process on the hair it is quite natural that one is desirous to also look into the hair and to observe the processes in the fibre cross section. For this purpose we prepared hair cross sections upright between stage and coverglass, and then the plane sections were fixed by means of appropriate putty substances with the glass in such a manner that it was possible

Normal dyeing of hair cross sections with oxydation hair dye
Scale 300:1



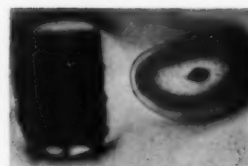
Dry preparation of 2 hair cross sections (upright and lying) prior to the adding of the dye liquor.



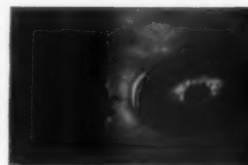
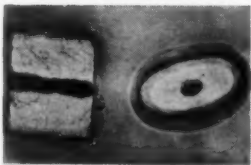
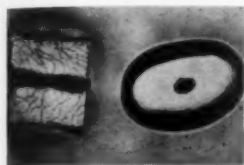
After entering of the dye liquor (diffusion of the solvent agent commences).



Dyeing result after 5 minutes acting time



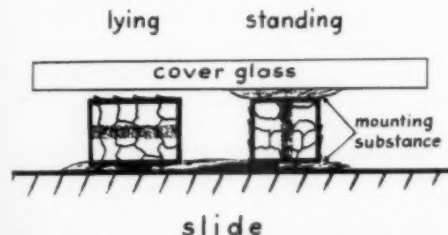
Termination of the dyeing process after 30 minutes



Similar process as above with subsequent oxydation

to observe through the mantel surface in vertical look direction thereto the penetration of some parts of the dye liquor. For a comparative observation a lying part was fixed with putty close to the upright cross section. In such a way each optically demonstrable phase of the dyeing process could be retained photographically and kinematographically in the quick motion procedure:

Radial sections of a hair



Scheme of a preparation of hair cross sections (60-80)

With the entering of the dye liquor into the "dye chamber" formed by the stage and coverglass the hair cross section begins swelling. Under certain circumstances it is possible to easily follow the penetration of the solvent through the fact that the diffusion front moves on visibly within about 2 minutes from the cuticula to the medulla in form of a constantly decreasing ring.

There is no doubt that the oxidation agent which is necessary for the dyestuff development penetrates equally. A few minutes later one observes the first symptoms of a dyeing starting from the periphery. The scale cover which dyes itself rapidly and intensively, and the intermediary membrane are overcome. During this procedure each component of the dyestuff mixture runs certainly as with the chromatography with its own diffusion rapidity, and so it is not astonishing that finally a kind of a reversed ring chromatogramme is formed, the frontside of which is formed by the direct dyeing, running more rapid, mostly yellow and red nitro-dyestuffs. Due to

the oxidative molecule enlargement the diffusion becomes constantly more slowly with the blond, brown or dark dyeing development dyestuffs so that in the course of the normal acting time of about 30 minutes the cross section is only dyed by half. This part-dyeing is macroscopically for the benefit of the transparency and the natural looking of the dyeing.

We suppose that at least the oxidation dyestuffs are held fast due to the heteropolar bindings between dyestuff molecule and fibre. Out of this fact results that the hair-dyeing is fast to light and to rinse.

The binding of the direct dyeing "nuanceur" dyestuffs must, however, be essentially looser. If the test is repeated with a dye liquor containing only such dyestuffs (the technical term of such preparations is "Haartonungsmittel") one can observe a surprisingly rapid, deep and solid dyeing of the fibre. The subsequent rinsing reveals however the bad stability of such a dyeing—no wonder that the fastness to light, too, of these so-called "Haartonungen", in spite of the good penetration depth, is less than that of real hair-dyeings with oxydation dyestuffs. In addition it is remarkable that the nitro-dyestuffs adhere less well in the hair lengths which are chemically more active, than in the good root hairs (near the scalp).

The depth of a hair-dyeing with oxidation hair-dyes, i.e. the so-called covering power, depends largely on the reciprocity dyestuff diffusion/oxydation which act simultaneously inasmuch as when dyeing in practice the dye and the oxidation agent are mixed before the application and then applied together on the hair. If the oxidation potential is increased one can expect a rapid dyeing of the cross section near the periphery but the penetration depth will be less. On the other side one can expect a deeper dyeing respectively a better covering power in case of a weaker oxidation or even better if the oxidation process begins later on, i.e. in case of a two-bath procedure. These two assumptions were in fact confirmed by the micro pictures: in the first instance small, annular dyeing; in the second instance so deep

**Oxydation dyeing of 6 hair shafts with the following
pre-treatment Scale 100:1**

- a) only washed with an alkali-free soap
- b) exposed to the influence of caustic alkali
- c) treated with a strong bleaching solution (10% H_2O_2)
- d) treated with a strong cold wave solution
- e) strongly damaged with a razor blade
- f) exposed for several hours to UV-rays.

The same process on 6 hair cross sections

- a) only washed with an alkali free soap
- b) exposed to the influence of caustic alkali
- c) treated with a strong bleaching solution (10% H_2O_2)
- d) treated with a strong cold wave solution
- e) strongly damaged with a razor blade
- f) exposed for several hours to UV-rays.

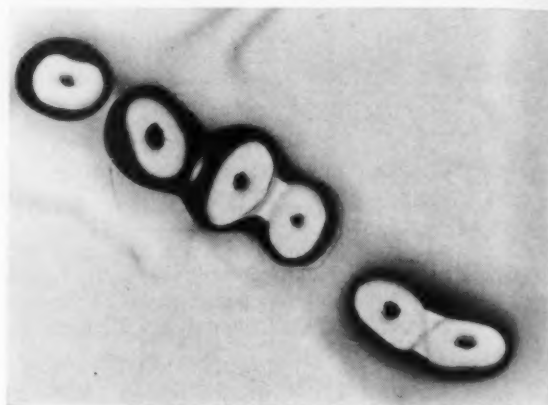
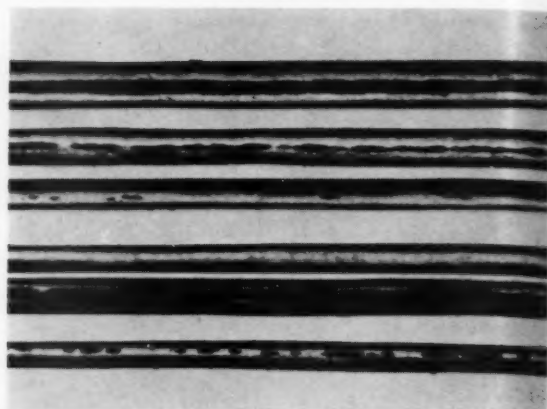
a penetration of the oxydation dyestuffs that now the yellowish-red inner zone of the nitro-dyestuffs is no more visible due to an over-covering. It stands to reason that the two-bath procedure is an undesirable complication of the hair-dyeing. One can, however, conclude out of these tests that the oxidation shall run very slowly with the usual one-bath procedure. To explain the various possibilities would take too much time but there are indeed some possibilities.

The assumption of the *chemical* binding of dyestuffs to the keratin fibre is supported by the special dyeing behaviour of the chemically or physically pre-treated hair. An even hair strand was cut by us into 6 pieces and we carried out on them the following treatments:

- Test 1: The strand was only washed with a neutral soap —
- Test 2: The strand was exposed to caustic alkali (without a visible deterioration of the morphological structure of the fibre) —
- Test 3: The strand was treated with a strong bleaching product (10% H_2O_2) —
- Test 4: The strand was exposed to a strong cold wave process —
- Test 5: The strand was mechanically strongly damaged by erasing with a razor blade —
- Test 6: The strand was exposed for several hours to the UV-rays of an analysis lamp.

Out of each strand we took one hair and these were fixed next to the other 5 hairs on the stage in such a manner that all 6 test strands could be observed simultaneously in one microscope and that they

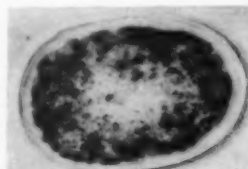
Dry preparation



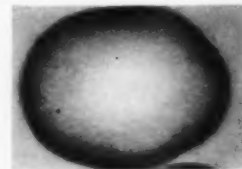
could be dyed commonly.

As expected the dyeing of the trial strands run in a fairly different manner. The permed hair was dyed most quickly. Then following the alkali-damage and the strongly bleached hair and soon thereafter also the UV-damaged and after a fairly long time at last and *simultaneously* the merely washed and the mechanically damaged hair. The dyeing ability coincided in the succession with the degree of the chemical transformation of the hair due to the pre-treatments. It is a known fact that the hair suffers the greatest

Comparison between natural coloured and dyed hair
Scale 800:1

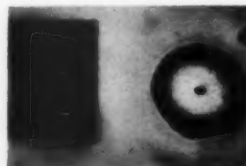


Dark brown natural coloured hair



Dark brown dyed hair

The influence of the H_2O_2 concentration on the dyeing result
Scale 300:1

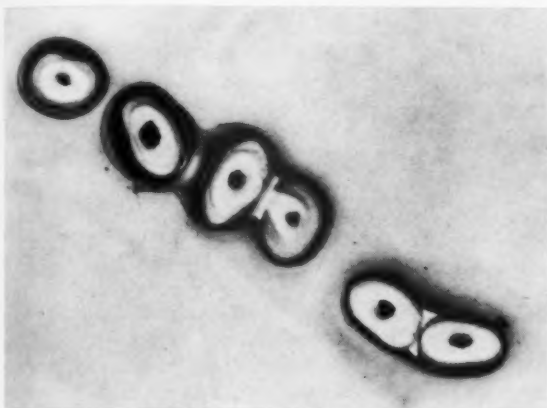
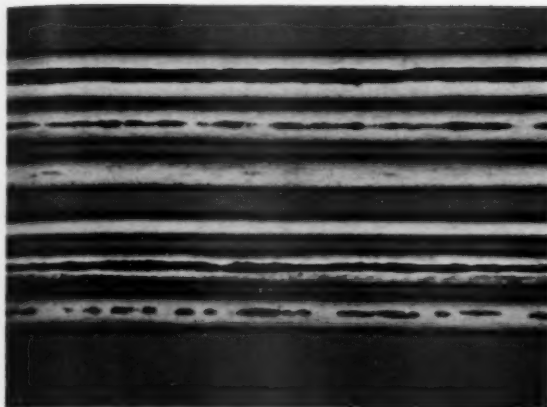


Normal H_2O_2 concentration

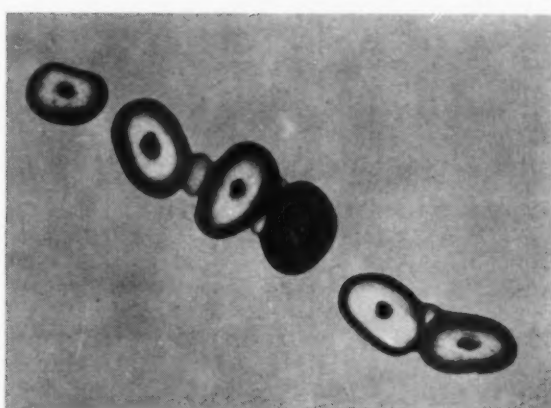
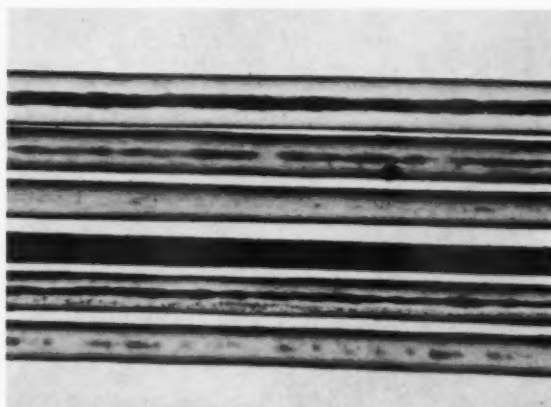


Double H_2O_2 concentration

After the swelling process



Dyeing result



transformation by permanent wavings. The binding possibilities are multiplied not only through the partly irreversible splitting of existing bridges and chains but also according to Schoberl before all through an increasing of the carboxy groups on the keratin molecule which is due to a one-sided accumulation of thioglycolate acid. The so treated hair owes its exceptional dyeing position to this interesting behaviour of the permanent waving product compared with each other hair which was activated chemically or physically. If one realizes the known damage reactions of the hair after exposure to alkali, bleaching products and UV-rays, the similar behaviour of the test trials is explicable. The substantially other and corresponding behaviour of the mechanically damaged and the non-treated hair confirms the former observations.

Another test with 6 hair cross sections puttied side by side reveals that the dyeings run not only in a different manner regarding speed and intensity but also that the dyestuffs e.g. with a permed hair also penetrate much deeper and finally fill up the whole cross section up to the centre.

Up to now the behaviour of the various nitro-dye-stuffs against differently pre-treated hairs seems to be not so clear. The permed keratin, richer on carboxyl-groups, also takes here an exceptional position; in addition it seems to depend largely upon the constitution of the used dyestuff whether the one or the other test strand or whether several or all test strands are dyed equally strong. It seems that in this respect

the greater molecular nitro-dyestuffs, like e.g. the nowadays interesting oxethylated nitros substances, approach more in the dyeing behaviour the oxidation dyestuffs than the simple nitrated amino substances.

Though these thoughts need still be explained more detailed it can be determined at least empirically through the mentioned trials with the microscopical observation how will be the probable behaviour of the one or the other dyestuff in hairdyes, especially what results can be expected not only on normal but also on uneven hair or the structure of which is damaged.

Before ending I would point out that the explained methods are interesting not only for the hair-colouring but—in the reversed direction—that they also open new possibilities of the hair-examination. It is also possible to utilize to a certain extent the ability of the hair to be dyed as an indicator for the chemical state of the keratin substance. In so far it is obviously—due to a refinement of the method—to prove and to fathom objectively the efficacy of other hair treating products of various kinds. The question is by no means the hair dyeing alone but also many other cosmetic hair treatments which can be cleared microscopically.

Literature

- 1) S. Preisinger—H. Dräger: "Mikroskopische Beobachtungen von Farbevorgängen am menschlichen Haar" Seifen, Öle, Fette, Wachse Nr. 11/1957
- 2) S. Preisinger: "Haarfarben unter dem Mikroskop" Parfümerie und Kosmetik Nr. 4/1958

Medicated Cosmetics

BY DR. T. A. RUEMELE

Comparatively recently cosmetic development engaged in the creation of novel products, or alternatively contemplating the modification and modernization of the conventional preparations, is devoting constantly increasing attention to the pharmacological aspect of the problems concerned.

This trend in support of a cosmetic medication has actually been fully expected, notably since, following the intimate collaboration between cosmeticians, dermatologists and the medical profession, emphasis has been placed on the intelligent interpretation of the physiological considerations affecting external agents for the skin.

While skin conditions may be treated clinically either orally or topically, depending upon the nature and constitutional circumstances of the pathological state involved, the cosmetic method in the management of skin problems is strictly confined to rely exclusively on the external application. Obviously, there is a distinct difference between these two dermatological interventions. The medicated treatment is chiefly required to palliate, ameliorate or suppress a morbid state. With the application of cosmetics in general, however, hitherto the aim has been to provide a prophylactic effect, or in other words, to supply a barrier to premature deterioration of the skin.

In contrast to the apparently accepted view that cosmetics would tend to counteract and thus eventually retard conveniently the incidence of cutaneous ill-effects, it should be most carefully considered that, in the absence of any physiological influence upon

the functions of the organisms involved, it is inconceivable to anticipate or suggest such a major action.

The purely superficial treatment with simple creams may admittedly assist in keeping the outer corneous layer soft and supple. However, due to lack of penetration or absorption, such a treatment will be inaccessible to the most important deeper layers and consequently histologically hardly of any material significance.

In order to be in a position to promote and ensure a successful skin treatment the need for intervening biochemically has been recognized, and as a consequence, a selection of therapeutically active agents since recommended. It should, however, be stressed that the assessment of the activity must primarily entail the consideration of the most appropriate physico-chemical condition under which absorption would occur without fail. The penetrating property of medicaments is not necessarily identical with that of the cream incorporating the agent. The decisive factor for penetration is the solubility of the medicament, and the higher the solubility coefficient in the skin in comparison with that in the vehicle, the better the absorption. The choice of the vehicle is equally important for liquid soluble therapeutic substances are best supplied from aqueous creams and conversely, water soluble agents from fatty bases. Incidentally, reference is made in the literature to the availability of special cream bases (e.g., Lantrol, vide *Drug & Cosm. Ind.*, 1959, 84, 3, 360) or particularly suitable

emulsifiers (e.g., ursolic acid methyl ester, vide German Patent 1,039,709) which were developed for the purpose of facilitating the required adequate contact between the active substance and the skin.

It has been ascertained conclusively that in general lipotropic agents would provide the requisite absorption affinity as opposed to the water-soluble compounds which might be able to act only superficially on the skin. However, the latter compounds could be converted chemically into effective agents for skin penetration, and indeed, particularly the vitamins of the B group, when esterified and hence made oil-soluble, acquire the properties normally required for the diffusion to the deeper layers of the skin. A representative of an esterified vitamin is the tripalmitate ester of pyridoxine (vitamin B₆) which is reported (13th International Congress for Esthetics and Cosmetology, Lucerne, Switzerland, September 1959) to be appreciably more stable than the free pyridoxine and whose biological activity (100 g ester) is quoted to correspond to 23 g pyridoxine chloride. Furthermore, esterified essential fatty acids (so-called vitamin F complex), with particular reference to the ethyl ester, due to the pronounced fluid consistency, are claimed to reveal a substantially improved ability for deeper penetration and therefore an indisputable superiority over the free acids, which, although the cause of various arguments, might be biologically effective, provided they comprise a high percentage of cis-isomers.


The view has been expressed that the beneficial effect experienced with esterified vitamins is predominantly due to the promotion of an enhanced blood supply and the normalization of the turgor of the cells. The vasodilating action whereby the blood supply is favourably influenced conferring to the skin ultimately a healthy complexion has been appreciated cosmetically for the more recently suggested cream formulations for the care of the skin include vasodilators, such as nicotinic acid, but preferably its esters and notably the n-hexylester, the reason being that the esterified alkyl group with 6 C-atoms affords the maximum of hyperemization and the minimum of irritation of the skin. Apart from the vasodilating property a sufficient hydration of the intercellular tissue is equally and invariably required. The so-called moisturizers, as a result of the chemical composition, assume the task of influencing suitably the osmotic pressure and thereby the surface tension with a view of enabling the occurrence of the penetration of the aqueous fluids from outside and the increased retention of the cellular fluid. Unfortunately, these moisturizers appear to contain essentially strongly hygroscopic substances which, due to their potency, would obviously act moisture-withdrawing rather than moisture-retaining. The healthy complexion of the skin is dependant upon an adequate blood supply and a satisfactory hydration of the intercellular tissue. Thus, suitable moisturizers, it is recommended, should comprise a mildly acting hygroscopic substance in conjunction with an agent producing an hyperemia effect (vide booklet on "Active Substances and Basic Materials for the Cosmetic Industry" by Chemical Laboratory Dr. K. Richter, Berlin). On the subject of moisturizers special attention is drawn to

the investigations referred to in various articles in *Drug & Cosm. Ind.*, 1958, 1, 32, 89, 118 and 2, 223, 239.

A number of steroids inducing merely hyperemization and stimulation of the cell growth have been described in various patent specifications (U.S.A.P. 2,845,381; BP 767,824 and 768,129 and Swiss P. 327,115 and 330,670) and recommended for cosmetic use (vide *Am. Perf.*, 1959, 73, 24). More recently a derivative of prednisone—triamcinolon—has been synthesized and proved to reveal a potent anti-inflammatory action (*Aerzt. Praxis*, 1959, 11, 39, 1311). When used for topical application good response is claimed for the following conditions: contact dermatitis, eczema of various origin, insect bites, drug exanthema and psoriasis. Particularly with regard to the treatment of the latter disorder the use of dextrorotatory lactic acid has been advocated (Seifen, Oele, Fette, Wachse, 1959, 319 and 467), since it could be ascertained that the disturbed lactic acid metabolism of the skin is the responsible factor for the occurrence of this morbid condition.

The combination of steroid-hormones with antibiotics has shown to provide more satisfactory results than the former group individually. Of the antibiotics suitable for cosmetic use bacitracin, neomycin, tyrothricin, evosin, terramycin have been investigated, but it should be stressed that from the point of view of the degree of toxicity upon the skin bacitracin only is actually completely safe and free from side-effects (*Brit. Journ. Pharm.*, 1959, 168). The other antibiotics mentioned, due to the objectionable sensitizing phenomena or hemolytic effects, would have a rather limited application, at any rate as far as cosmetic use is concerned. Nevertheless, tyrothricin has lately been incorporated in a cosmetic preparation, apparently with success, to counteract, in conjunction with a germicide, various skin disorders.

The effect of germicides in combating allergic skin affections is largely dependant upon the medium selected. It has been established that small concentrations of non-ionic substances (e.g., Tween 20) would act synergistically upon the germicide (e.g., hexachlorophene), whereas large concentrations would diminish or effectively eliminate the bacteriostatic action (*Arzneimittelforschung*, 1957, 7, 400). Incidentally, it will be remembered that the potency of the preservatives is equally influenced by the presence of non-ionics (*Journ. Soc. Chem.*, 1957, 8, 68). A newcomer which is active against both Gram-positive and Gram-negative bacteria and completely non-toxic is triburon, a symmetric beta ionone derivative of 1, 6 hexanediamine. It proved very useful in the treatment of skin infections. Quite a novel development in this field is the formulation of a sustained-release antiseptic comprising a complex of iodine with polyvinylpyrrolidone. Triacetin, glyceryl triacetate, may similarly function as a sustained-release compound, since it is characterized by the slow release of acetic acid by esterase normally present in the skin. The mechanism therefore augments favourably the acid coat of the skin and enhances the defence against fungal infection (*The Chemist & Druggist*, 1959, 636). On the subject of sustained-release action the aluminium derivatives of allantoin (*Amer. Perf.*, 1959, 73, 37 and *Drug & Cosm. Ind.*,



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1959, 84, 36 and 117) should be quoted as they combine the properties of the astringent and bacteriostatic action of the aluminium with the healing effects of allantoin (*Journ. Soc. Cosm. Chem.*, 1958, 1, 58). Aluminium dihydroxy-allantoinate, for example, is indicated whenever only mild astringency and slow release of the reparative action of allantoin is desired, such as for inflammatory affections and weeping skin eruptions. It would serve to dry up weeping areas and act as a mild antiperspirant, preventing chafing, especially during warm weather. The astringent action produced is effective but mild and never uncomfortable. The allantoin part of the radical inevitably performs its reparative action by healing any broken down tissue which may be present. Its cell-proliferating action keeps normal cells constantly in good function, thereby ensuring soft and healthy skin.

This review cannot be concluded without referring to the considerable significance which is being attached to the beneficial action of amino acids and in particular to compounds such as S-Furyl-hydantoin or Furylglycine (*Journ. Soc. Cosm. Chem.*, 1959, 10, 77), claimed to exhibit hydrating, tonic, cleansing and smoothing effects upon the skin. Vegetable and fruit juices (Germ. P. 967,054 and 1,003,919), soya-morpholine compounds (U.S.A.P. 2,857,434), cationic exchange resins (Germ. P. 1,004,774), combination of cationic, anionic and carboxylcationic exchange resins (U.S.A.P. 2,857,311), urea condensates (Austrian P. 196,562) have all been proposed for appropriate incorporation in and subsequent activation of a number of cosmetic preparations expected to provide relief promptly and satisfactorily in cases of deteriorated skin conditions. Taking into account those agents mentioned and described earlier elsewhere (*Perf. & Ess. Oil Rec.*, April 1959 and *Parf. & Kosm.*, 1960, 1, 1) it will be agreed that there is now a well-assorted range of compounds available for the medication of cosmetics. It would, however, seem that research is endeavouring further to produce suitable alternative activators or to improve substantially the existing one, thus expanding considerably, but at the same time rendering rather difficult, the ultimate choice. It is also worthwhile noting that plant hormones (phytohormones), due to the cell-activating properties, are gaining gradually importance, as it would appear to emerge from the publicity given following the interesting dermatological effects obtained.

From the preceding informative data, no doubt, it has been sufficiently realized that the tendency of modern cosmetics, by virtue of the skillful formulation incorporating therapeutically recognized active agents, is to perform a definite and systematic action and thus to deviate from the purely superficial and merely lubricating treatment of practically little therapeutic value. However, prior to any contemplated incorporation, it is vitally important to ascertain, beyond any doubts, whether the corresponding agent will be wholly or partially absorbed, since absorption must necessarily imply the accurate determination of the skin compatibility. The proper medication and hence activation of cosmetics opens an entirely new opportunity to substantiate the claims and subsequently to restore the confidence.



Frescoes fragment of the Thracian Tomb 4 B.C. near Kazanlik, THE VALLEY OF ROSES

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Helena Rubinstein at her office in the East Hills factory with her technical staff. Left to right, Victor Silson, Dr. Julius Wetterhahn, Mr. Swieca and Casimer Kozeski.

COMPANY PROFILE

helena rubinstein, inc.

BY JILL JESSEE

Madame Helena Rubinstein's first advertisement in the United States in 1915 gave women a *scientific* reason for buying a beauty product, which was the first time science had been invoked in the name of beauty. Our "first lady of beauty" has never changed her mind or her *modus operandi* in all the forty-five years since. The god of science was not only wed to the goddess of beauty in 1915, but there has never been even a rumor of divorce. Madame Rubinstein makes scientifically sure first, and also tries to be first with a scientifically sure thing. Her record on both counts speaks for itself.

This stress on the scientific was no accident. The young Helena, prodded by her father, just missed being a doctor herself. She studied medicine at the University of Zurich, but the sights and smells offended her, and the very idea of surgery and blood sent

her scurrying back to her native city of Krakow, Poland. But the experience left her with a profound respect for doctors, who have played an important role in her cosmetic business along with other scientists and technicians.

In fact, her business life owes its start to a certain Hungarian physician who formulated a cream for her mother and a small circle of customers. When Helena abandoned medicine, she took off for Australia to visit an uncle on his sheep ranch, taking with her a few jars of this concoction made from the bark of a Carpathian tree and a blend of efficacious herbs. The Australian women with their dry, rough skins were impressed by the beautiful complexion of the young lady from Krakow and begged her secret as is the wont of women everywhere. At first, she gave away the cream, ordering it from her mother in

Poland. Then as insistence grew, she sold it for four shillings a jar. And as demand continued to grow, she borrowed capital and set up shop in Melbourne. The aforementioned physician left his practice in Krakow and joined her. In one year's time, sales reached the fantastic equivalent of \$100,000, at the rate of 10¢ profit on each jar.

This original cream, which launched a beauty empire, was called "Valaze," and is still in the Rubinstein line today under the name of "Wake-up Cream." Although no longer a real seller, it remains Madame's personal choice for her own complexion when exposed to the sun or when her skin seems sallow or lacking its usual life. Perhaps, like keeping one's first love letter, a small matter of sentiment is involved.

The Maison de Beaute was opened in London in 1908 and London society flocked to her door. Again, she relied on the help of science, bringing over a Viennese chemist to train her beauty treatment girls.

The War brought her and her husband (Edward William Titus, an American newspaper man) to the United States and she opened her first Maison de Beaute in New York in 1915.

Her first advertisement, already mentioned for its scientific slant, was for a sunburn preparation. This, in itself, was another first, and just think what that started! By 1917 she had salons in San Francisco, Newport, Palm Beach, Bar Harbor, Boston, Washington and Philadelphia as well as New York. Along came department store demand for her beauty products, which at that time, seemed like a possible threat to her prestige, but she was shrewd enough not to resist for long, providing she could train the salesgirls in her own methods and preparations. The City of Paris in San Francisco was her first account. Today the Rubinstein line is sold in approximately 15,000 selected franchises (department and drug stores) in the United States alone. This requires a large staff of school-trained traveling representatives as well as salesmen. Madame Rubinstein was the first to hire women for wholesale selling.

The Helena Rubinstein world-wide beauty business grosses between 60 and 80 million dollars yearly; her business in the United States alone is close to 30

million dollars, putting it up among the giants. Helena Rubinstein is represented in 100 countries with factories, salons, laboratories, warehouses and distributors in every corner of the world. The 14 factories include a number of new ones—Dusseldorf, Germany; Johannesburg, South Africa, one in Israel; and one each in Sweden and Norway not yet completed. The largest factory, of course, is the one at East Hills, Long Island, opened 9 years ago at a cost of \$4,000,000. This ultra-modern structure reflects the genius of internationally famous industrial designers and provides the ultimate in scientific benefits and working conditions.

The two-story building covers eight acres on a 20-acre site. 1,000 people are employed here where production has been tripled over that of the previous plant. Among the features that implement the scientific activities are: extensive storage facilities for raw materials; weather-resistant containers for the preservation of essential oils; stainless steel vats; underground storage tanks with a 10,000 gallon capacity for storage of oil, and alcohol and essences; gravity flow feed so that finished products can flow to bottling machines and belt-line assemblies on the floor below; a special odor testing room which is sealed in with blower ventilating fans which purify the air for delicate odor testing of fragrances.

Madame Rubinstein has a beautiful office in the factory but she loves spending her time there "getting her hands all gooey" or waylaying one of her chemists to check on the status of something still in its test tube phase. More often than not, what is being worked on is her own discovery or inspiration, something she has either dreamed up or bought up. Always, always, she is directing, urging, arguing—to achieve the Rubinstein perfection founded strictly on scientific research.

Her scientific and technical staff is probably second to none in the entire cosmetic industry. There are 23 chemists in the United States; 12 in London; 10 in Paris; 15 in South America; 5 in Canada; 6 in Sweden, Norway, and Denmark; 25 in Switzerland, Spain and Germany; and additional ones in other countries. The European chemists come over here

This brand new factory and laboratory building in Johannesburg, South Africa, is typical of the company's confidence in future world-wide growth.



twice a year besides shuttling around among themselves over there to exchange views and discoveries.

There are now between 400 and 500 items in the Rubinstein line, and new ones come out at the rate of almost one a month. These are not, however, just a vast and bewildering assortment of individual products, but represent a number of related and inter-related groups including the following, most of which are "Firsts" in one way or another in the beauty field:

1) *Hormone Preparations*

To quote from Madame Rubinstein on this subject: "Some thirty years ago I worked with the celebrated Dr. Joseph Kapp of Vienna. Out of this exciting research came my estrogenic hormone cream for external use on the skin, the first of its kind. This cream achieved remarkable results in restoring moisture retention within the deep skin layers. It won half the battle against aging skin.

"In recent years I have again been involved in a vast and exciting hormone research project, this time aided by doctors, research scientists, hospitals, universities, clinics, all over the United States. The result is 'Ultra Feminine Face Cream'. It is the first wonder drug cosmetic to contain both vital female hormones, *estrogen* and *progesterone*."

2) *Silk Line*

Homogenized atomized silk is incorporated into certain Rubinstein makeup items to provide a soft, silken finish to the skin. These include "Silk-Tone Special Foundation" which also contains estrogenic hormones so that it serves the double purpose of being a treatment as well as a make-up base.

3) *Eye-Make-up*

The term, "waterproof," is associated with eye preparations created by Madame Rubinstein, although it has been adopted by others since. This term applies not only to her mascara but also to her more recent eye liner. One of her proudest "firsts" is "Mascara-Matic," introduced a few years ago, a slender golden pencil containing a hidden supply of waterproof mascara, an invention which makes obsolete the old-fashioned kind of mascara in a tube or cake requiring the messiness of a brush.

4) *Moisturizer*

In the spring of 1956 "Skin Dew Moisturizing Emulsion" was introduced in the United States, but it

had been developed in her French laboratory and introduced there the preceding year. It contains activated "ferments lactique (fermented milk proteins) which protect the acid mantle of the skin, as well as a detoxifier for its antiseptic properties.

But Madame Rubinstein can also reject ideas as quickly as she can accept them. She is against such fads as white lipstick, for instance. And, after very careful and thorough investigation, she rejected the idea of bee jelly which some others plunged into recently. Her eyes and ears are constantly alert for something new abroad that can be developed and marketed here, alert for the scientific proof, alert to competition as well as to what is going on in her own citadels. Thus she manages to keep ahead in the beauty field and to keep ever-young and vital herself.

Her age can be estimated but not fixed for the simple reason that it's as much of a secret as her formulas. She admits, however, to being of the same era as Picasso if that satisfies anyone's curiosity.

Above all, she is a matriarch in the old-fashioned sense of the word. Many members of her family have been and some still are associated with her business. Her older son, Roy V. Titus, is Chairman of the Board. Her nephew, Oscar Kolin, is Executive Vice President in Charge of Marketing. Her niece, Mala Rubinstein, is Director of Product Development. There were originally eight sisters in the Rubinstein family. Ceska and Stella, the only two sisters still active in the business, are connected with the London and Paris branches respectively.

Only 4' 10" in height, Madame Rubinstein is a little dynamo. Her most quoted remarks are, "I can't help making money," "Do the big things first, and the little things come easily," and "I have always been deeply involved in science." These typify her as a personality and as a business success and have made her the legend she is today.

We salute Madame Rubinstein, who was one of the first in the cosmetics industry to accept the vital services of medical and scientific counsel, and who built solidly on the basis of scientific evaluation and research. The great organization that has been developed in this company is adequate proof that it has served the consuming public well, and that it can expect to be doing so for many years in the future.

This is one of the testing laboratories in the East Hills factory. The chemists are Casimer Kozeski and Hilary Laks.



This is one of the many laboratories in the East Hills Factory. The chemist is J. Deal.





SPEAKING FROM FRANCE

A. E. DESPERROIS has an M.A. degree in Sciences and is a Chemical Engineer E.N.S.C.P. (Ecole Nationale Supérieure de Chimie de PARIS). He has managed the technical services of Jean d'ALBRET-ORLANE Company of Paris, producers of perfumes and beauty products, since it was founded. Previously he was a Consulting Engineer in perfumes and toilet goods.



Glycerine

IN MAKE-UP PRODUCTS

Since SCHEELE, 180 years ago, made his famous communication to the Pharmaceutical Society of Upsala regarding his discovery in the residue from pharmaceutical plaster manufacturing of a sugary liquid, the many uses of glycerine (as it was named by Chevreul) have multiplied and even the later discovery of glycols and of other polyols has not slowed down its progress.

Some of those uses have had tremendous repercussions, if only in dynamite, but we shall only deal here with the more peaceful uses. Glycerine is used in the cosmetic industry in a great number of preparations, because its desirable properties cannot all be replaced by any other product comparable with glycerine.

1—Its hygroscopic power is superior to that of all the other polyalcohols. A 57.6% solution of glycerine has a composition which is invariable in normal atmospheric conditions. The presence of glycerine, even in small proportion (between 2 and 5%) gives the water content of a cream a permanent quality which is extremely valuable. These days when hydrating, or mois-

turizing products are so much in demand, the presence of glycerine remarkably increases the hydrating power of a preparation.

2—Glycerine has a dissolving and plasticizing power superior to that of water. This property is particularly interesting, since a great number of products are used nowadays in the foundation of modern creams and it is necessary to present the public with perfectly homogeneous products. The presence of glycerine in a make-up cream enables the pigments to spread out far more uniformly, thus giving a cream which can be used more easily on the skin.

3—It is particularly rare to discover a skin, even among the most sensitive and delicate, which will not tolerate glycerine solutions. It is on the contrary a very softening product. Furthermore, it has advantage over certain glycols in that it is not toxic.

4—Glycerine does not change with the contact of air in normal temperature conditions. Thus it is not to be

feared that unusual colors will appear nor that odors will eventually develop due to glycerine when products are kept for a long time. This stability is extremely important particularly in liquid make-ups where color variations can take place during the life of the products.

5—Glycerine is chemically compatible. If coloring materials and pigments have pH which is very different from the neutral 7, they still may be acceptable in a glycerine formulation.

6—Glycerine also possesses a fixing power for the perfumes; one knows how difficult it can be to maintain permanently the same perfume note to accompany a make-up product because of evaporation or internal reactions. The presence of glycerine in a make-up insures conservation of the perfume note chosen until the product has been used up.

In all the make-up products, whether they be creams, bases, cream rouge, lipstick, the product which is spread on the skin must not penetrate too deeply. Whereas, in a treatment cream one looks for a very powerful penetration quality for the base, which will support the active product. On the contrary, make-up products should not penetrate the skin. The problem is thus entirely different regarding the use of glycerine in make-up. At the level at which glycerine is used in make-up products its penetration is sufficiently low to avoid undesirable effects.

For still more complete reduction of penetration where it is not desired, it is frequently the practice to use starch glycerol which possesses all the softening and hygroscopic qualities of glycerine. Starch glycerol or glycerite of starch as it is also known, is composed of the following ingredients:

Starch	10 grams
Distilled water	20 cc
Glycerine	70 cc
Preservative	

When a smooth paste of starch, water and glycerine is made, the mixture is heated to around 140°C under constant stirring until the jelly becomes translucent.

LIP JELLIES

Poucher has suggested a number of formulas for lip jellies based on a glycerol-gelatin composition (1). As a basic recipe the following is used:

Glycerine	750
Gelatin	20
40% Formaldehyde	10
Distilled water	220
Total	1000

This formula may be modified by adding either a solution of eosine or of an ammoniacal solution of car-

mine. Although rose is a popular fragrance, others may be used.

Cerebelaud, the celebrated French perfumer and cosmetic chemist approached the same product slightly differently (2).

Edible gelatin	20 grams
50% Glycerine in rose water	1000 grams

Although varying in approach, the end product contains 2% gelatine in a 50% (approx.) glycerine solution in an already perfumed vehicle, rose water. This jelly may be tinted to suit.

A liquid lipstick formulated along modern lines is attributed to deNavarre.

Polyvinyl alcohol	4 parts
Glycerine	2 parts
Soluble color	1 part
Alcohol	10 parts
Water	83 parts
Total	100 parts

Here the glycerine acts as a plasticizer for the polyvinyl alcohol and prevents drying of the lips.

A liquid rouge in former times was a simple solution of carmine in enough glycerine and water to give the product penetration, lubrication during the application and a moist "dewey" appearance that was considered natural.

However liquid rouges of today are exemplified by the formula given by Heinrich (3).

Color	6.0%
Glycerine	4.0%
Methyl Paraben	0.1%
Diethylene glycol stearate	9.0%
Spermaceti	3.0%
Sodium lauryl sulfate	1.0%
Water	76.9%
Perfume	q.s.

This is a creamy liquid emulsion which may contain both soluble coloring as well as color lakes.

A solid cream rouge currently popular is based on vanishing cream utilizing the plasticizing properties of glycerine. It consists of the following materials (3):

Stearic acid	20.0 parts
Cetyl alcohol	2.0 parts
Glycerine	10.0 parts
Potassium hydroxide	1.0 parts
Water	58.9 parts
Pigment	8.0 parts
Methyl Paraben	0.1 parts
Perfume	q.s.

A more recent version of emulsified lipstick is the following formula devised by Velon (4).

Triethanolamine	6.5 parts
Glycerine	21.5 parts
Eosine solution	3.0 parts
Stearic acid	15.0 parts
Mineral oil	22.0 parts
Ozokerite	26.0 parts
Oleic acid	8.5 parts

This type of lipstick was exceedingly popular some thirty or so years ago in a somewhat different formulation. The above formula may be modified by color lakes to make more acceptable lipstick shades in these modern times. Moisturizing is "built" into the lipstick while emulsification is obtained with currently available materials.

Liquid powders of former times often contained from 10–15% glycerine along with the usual pigments such as talc, zinc oxide, precipitated chalk and suitable colorants of the earth pigment class.

A transitional product between the older liquid powders and the modern liquid make-up is exemplified by two formulas, both patented some time ago. In the older formula, use is made of undecylic (5) acid to give a better wetting to the pigments and longer lasting properties on the skin.

Zinc stearate	3.8 parts
Undecylic acid	0.2 parts
Titanium dioxide	8.0 parts
Talc	10.5 parts
Glycerine	6.0 parts
Water	80.0 parts

The latter formula patented during the last war does not utilize glycerine directly but it does use glycerol tristearate to reduce the surface tension of the oil vehicle (6).

Sesame oil	64.0 parts
Zinc oxide	11.0 parts
Titanium dioxide	16.0 parts
Oxycholesterol	2.0 parts
Glycerol Tristearate	1.0 part
Color	5.5 parts
Perfume	0.5 parts
p-Hydroxybenzoic acid	q.s.

For the past few years, semi-liquid make-up bases containing bentonite have been successfully used. They have a great advantage: They dry fairly quickly on the skin thus giving it a powdery aspect which is very attractive, but they still have one problem: as they dry they have a tendency to tighten the skin thus creating a sort of mask. This is where the use of glycerine is particularly appreciated. The drying process is slowed down according to the quantity of glycerine used. The astringent action is overcome by the softness and hygro-

scopic quality of glycerine, and as a result one can create a make-up base which will correspond exactly to what one has in mind.

Here are a few formulas for make-up products in which glycerine appears:

1—Triethanolamine stearate	25
Water	35
Glycerine	20
Titanium dioxide	5
Pigment	15
Preservative and perfume	q.s.

2—Talc	40
Starch glycerol	10
Sorbitol laurate	10
Zinc oxide	20
Sorbitol syrup	3
Mineral oil 65/75	1
Water	16
Color, perfume and preservative	q.s.

3—Bentonite U.S.P.	2.5
Titanium dioxide	2
Water	40
Glycerine	25
Propylene glycol	6
Carbitol	6
Triethanolamine stearate	3.5
Mineral oil 65/75	5
Color	10
Preservative and perfume	q.s.

A blemish covering preparation, the patent for which is outdated (7), consists of

2041 grams zinc oxide
720 cc distilled water
300 cc glycerine

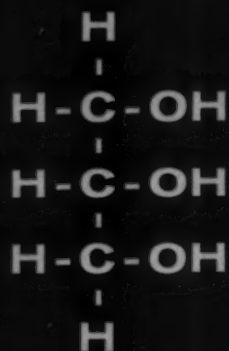
This thick paste was then suitably colored. However, glyceryl monostearate 40%, triethanolamine stearate 40%, beeswax 10% and carnauba wax is a good starting point in formulating cake mascara.

To sum up, while glycerine is useful in formulating cosmetic creams it is important in compounding make-up products as well. It possesses plasticizing, moisturizing, spreading and fixative powers so necessary in make-up. Its lubricating and coupling action are not to be dismissed either. When used in sufficient concentration it is a preservative. One must not dispose of starch glycerol and glycerol gelatin too quickly as valuable glycerine modifications for use in make-up and other cosmetics.

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NOTHING TAKES THE PLACE OF ...
Glycerine

Phosphoric Acid Compounds in Cosmetic Preparations

BY JOSEPH NUSSLEIN, PH. D.
Farbwerke Hoechst AG.

In the treatment of the skin, numerous tasks fall to dermatologists and cosmeticians. While the dermatologist is essentially engaged in healing diseased skin, the cosmetician is expected either to create agents for overcoming minor physical defects and injuries such as occur day in and day out in the form of dryness of the skin, exfoliation, reddening, itching, etc., or to prevent the occurrence of such damage altogether. All these agents are to have a refreshing, suppling effect. Old skin is to be rejuvenated.

Both the physician and the cosmetician have, therefore, always been on the look-out for substances that might be used either as such or as carriers for other pharmaceuticals and active bodies.

Animal and vegetable fats such as olive oil, lard, etc., have been known as cosmetics for time immemorial. The fighters in the Greek arena who rubbed themselves with oil and scraped it off again with a sickle-like spatula, by means of this cosmetic not only achieved a smooth skin and a good cleaning, but due to the composition of the primitively produced olive oil of that time, they thereby applied a thorough cosmetic treatment since free fatty acids, especially free hydroxy-fatty acids, show lasting adhesion. In lanolin, that old cosmetic, too, hydroxy-fatty acids play an important part.

Although the animal, vegetable and mineral kingdom provided the physician and the cosmetician with all kinds of substances, active principles as well as carrier substances, it was only modern chemistry that created completely new types of detergents, emulsifiers, water-soluble fat-liquoring agents, etc., and thereby gave a new, drastic turn to the previously stable system.

The auxiliary materials required by the cosmeti-

cian for his different tasks must be very versatile, since it is not to be expected that all problems can be solved by one product alone. Several of these materials are suitable for short-term action only, for instance for cleansing the skin, to be rinsed off again. Such preparations do not remain on the skin for a long time and are not absorbed by it. The need for products that are tolerated by the skin over long periods is very universal, and it is understandable that physiologists, cosmeticians, chemists, and especially dermatologists look for types that by their nature, i.e., by their chemical composition, are similar to substances occurring in the skin itself.

Among such types are, in the first place, the higher-molecular fatty acids, their esterification and modification products: mainly the fatty acids with their different chain lengths, saturated or unsaturated, or hydroxy acids; as esterification component, glycerol; finally, cholesterol. Solubilizing groups are provided by the hydroxy groups of hydroxy-fatty acids and, above all, by glycerol in the form of mono- and diglycerol fatty acid esters. As groups giving a negative charge, we primarily find only the COOH group in the fat metabolism of the skin, and phosphoric acid in numerous phospholipids of the skin and the body.

Our knowledge of these compounds, particularly of lecithin and kephalin, is fairly old; but for the information about their presence in the skin, the relative proportions and the processes of their origin and decomposition we are indebted to R. N. Koppenhofer who in the years from 1934-38 published his extensive work on the lipid content of hides. A good compilation of the literature is found in St. Rothman's excellent work "Physiology and Biochemistry of the Skin".

Rothman states that the phospholipid content of

the adult's skin is 0.7-0.8% of the dry weight, which is so much that it can no longer be ignored. Incidentally, I would mention that the organism does not use sulphuric acid as solubilizing agent for the production of fat derivatives, although enough sulfur is available to the organism.

These connections are very interesting subjects for both speculation and research. We cannot go into detail here, however. It should only be pointed out that the phosphoric acid radical is found in many compounds in the body, and even in every cell, so that phosphoric acid derivatives in the body must, in principle, have extremely favorable tolerability and versatility. The polybasicity of phosphoric acid undoubtedly also plays an important part in this connection.

The idea would now seem to suggest itself that lecithin and kephalin, amply available in nature, should be used in cosmetics to a greater extent, since they can be obtained very easily and at low prices from animal organs, oil seeds, egg-yolk, etc. They have a low melting point, swell considerably with water, are readily miscible with other lipids, are of amphoteric nature and are strongly adsorbed by the skin. Above all, they are poor wetting agents.

The strong wetting effect shown by many up-to-date surface-active detergents, for instance dodecyl sulphate or ethylene oxide derivatives of dodecyl alcohol, evidently is a very undesirable phenomenon in the metabolism of the skin. It is quite different from the spreading and absorption processes.

Unfortunately, however, it is very difficult to obtain lecithin and kephalin as uniform substances from the aforementioned sources. They are very unstable to air, light and bacteria; they dissolve only incompletely in water and also are not sufficiently active as emulsifiers to fulfil the many tasks of modern cosmetics.

It was, therefore, by no means a bad idea to examine the question whether the unstable natural products could not be replaced by synthetic, although somewhat different, types which, of course, should not differ too much in their fundamental properties, but should be superior in technical efficiency.

Here, too, of course, the difficult question remains unanswered: how much can be expected of a product for care of the skin that is applied externally—as it were, against the direction in which the skin is developed and in which its metabolism takes place—, however similar this product may be in composition to substances contained in the skin itself.

It would seem exaggerated, however, to look at the matter only from this point of view, since the outer layers of the skin, too, need effective care, and there are many possibilities that suitable auxiliary materials will penetrate and migrate deeper into the skin.

If we, in order to build up synthetic phosphoric acid compounds, select, for instance, a long-chain alcohol, say, C_{12} to C_{18} , and if we replace glycerol by glycol, diglycol or a polyglycol, and then esterify such fatty alcohol ethers with phosphoric acid, a wide range of products resembling lecithin in many respects is obtained.

In this way,
the primary,
the secondary,
the tertiary ester

are obtained, and we can deliberately prepare mixtures and various salts from the individual types.

If such products as the esters of lauryl alcohol in an aqueous solution of 1 g/l, are compared with lauryl sulphate or a common soap, we find that the phosphates, too, are very sensitive to hardness. While, however, lauryl sulphate is an excellent wetting agent for kerton surfaces—even better than soap—the wetting effect of the phosphates is practically nil. It might be argued that this is caused by the poor solubility of the phosphates since the tertiary ester is entirely insoluble in water.

But if we switch over to lauryl tetraglycol ether, esterify it in the same way with phosphoric acid or sulphuric acid and include also lauryl tetraglycol ether itself in the comparison, we again obtain the primary, secondary and tertiary phosphoric acid esters. The properties of these compounds have been considerably changed thereby: Solubility has increased; stability to hard water (even water of 356 p.p.m.) is fairly good, but in the wetting test with wool, 0.8 g/l of lauryl tetraglycol ether now correspond to

- approx. 1.1 g/l lauryl tetraglycol ether sulphate (sodium salt)
- or approx. 3.3 g/l lauryl tetraglycol ether phosphoric acid of the primary ester (sodium salt)
- or approx. 4.3 g/l lauryl tetraglycol ether phosphoric acid of the secondary ester (sodium salt)
- or approx. 10. g/l of the tertiary lauryl tetraglycol ether phosphoric acid ester.

In the washing test on soiled wool (with street dust), lauryl tetraglycol ether washes very well (80% effect); lauryl tetraglycol ether sulphate, well (40% effect); the three phosphates, however, have practically no washing power at all even in soft water. Even if the glycol group inserted between the fatty alcohol and the acid radical is increased to 8 ethylene oxide groups (whereby, for instance, the washing power of the phosphoric acid esters on soiled cotton also becomes very considerable), the phosphates remain far inferior to the analogous sulphate in washing wool.

Undoubtedly, these are connections which are decisive of the usefulness of phosphoric acid derivatives in the living organism. The organism needs hydrophilic, hydrotropic, transporting effects without the surface activity of the wetting and washing agents. It also seems to be certain that the easy formation of protein salts between the protein compounds of the skin or of the ferments and the sulphuric acid derivatives is an undesirable additional effect.

Of course, there are also very great differences between the phosphoric acid compounds; and the situation described in this brief discussion does not apply to each of the many possible phosphoric acid compounds alike.

After all, the primary and secondary esters still

are strong electrolytes, which the tertiary esters no longer are. This means a very considerable differentiation of the products within the group of phosphoric acid derivatives generally. It may be assumed, however, that the semi-polar =P-O-grouping still is strong enough for a loose adhesion of the surface film to the protein substances of the skin.

For the cosmetician, the water conservation of the skin is of elementary importance, and his interest in the water retention of a cosmetic is therefore very great. When we compared the phosphate, sulphate, and polyglycol ether series in 20% aqueous solutions standing in the air, we found in all of them that

after 6 hours only about half,

after 3 days 5-8%,

after 5 days, in several cases, remains of the original amount of water were still present.

The water was lost surprisingly fast by the glycol ethers of the lauric alcohol, i.e. the tri-, tetra- and octaglycol ethers. The lauryl sulphates and Marseilles soap likewise give off the water quickly.

The simple phosphoric acid esters of lauric alcohol, i.e., those containing no glycol, retain the water more obstinately. The tertiary ester still contains as much as 8.6% water after 7 days.

It was surprising, however, that phosphoric acid esters of polyglycol of molecular weights of 300 and 600 which were subsequently esterified with stearic acid gave off the water even more slowly: although 45% of the original amount of water had also been evaporated after 6 hours, 15-20% was still present after 3 days, and 10-12% after 4 days. The phenomenon deserves thorough examination for utilization in cosmetics.

The fact that several firms in Germany have been very successful in introducing hair tonics containing considerable additions of phosphoric acid esters is certainly not only due to the aforementioned good properties, but possibly also to their good antistatic effect.

Phosphoric acid esters range in physical appearance from liquids to solids. Despite their poor washing and wetting properties, they are excellent emulsifiers for a great variety of substances such as fatty acids, fatty alcohols, neutral and mineral oils, etc. In some cases, they have proved very good vehicles for other substances into the skin but, of course, in that respect one should not expect too much of these types either. Naturally, the colloidal structure of the solutions of the phosphoric acid esters is an excellent help for producing fine dispersions or solutions of other substances and mixtures of substances, and for their transportation into the skin, perhaps even through the skin itself. For there is not one best product or system—it is necessary to develop the system separately in each case, depending on the task. However, the entire group of the phosphoric acid esters, which are called Hostaphats offers an immense variety of individual types with different properties.

It is important, for instance, to remember that the system of water/fat (neutral fat, mineral oil) is by no means active. Even the skin containing a modified water/oil system is still inert. Only by incorporating appropriate mediating substances, such as phosphoric acid ester which are capable of swelling with

water or are even lipophilic, is it possible to form an active and rather stable skin-fat-water system.

To determine the compatibility with and within the skin we have made numerous dermatological tests, especially in cooperation with Professor Schneider, Augsburg. It was found that the compatibility of the phosphorous compounds on skin is offering excellent opportunities for both dermatologists for salves and cosmeticians for a great number of cosmetic preparations. Whenever we used too low-molecular fatty alcohols, for instance C_8 - D_{10} , which show a considerable wetting capacity, we observed irritation of the skin. Alkali salts of several primary and secondary esters have also been too strongly effective as electrolytes, which resulted not particularly in irritation in the strict sense, such as formation of vesicles, or reddening, but in dryness of the skin. On the other hand, however, even such types when combined with other substances have been found to be excellent.

In the case of the phosphoric acid derivatives, too, it is often important not to take too great amounts, and in general it is better to use combinations instead of a single substance. Frequently even small additions of phosphoric acid esters promote considerably the effect of a cosmetic. The process of decomposition of lecithin within the skin shows that nature itself works not with one substance alone, but in a polyvalent way, and that the high water content of the skin plays a decisive part.

If such combinations are properly controlled, we may even offer mineral oils to the skin without apprehension as to stagnation of perspiration or heat since after the mineral oils have been transformed into colloidal solutions they are no longer capable of blocking and of conveying hydrophobic properties.

The mixtures which we incorporate in the skin should be hydrophobic only to a limited extent, as is the natural sebum. On the other hand, they should not be washed away from the skin by water, i.e., perspiration or rain, at the first touch. These combinations may also penetrate deeper into the skin layers, so that they have a lubricating effect even in a wet medium, similar to the action of skin fats. In this way, the important perspiratio insensibilis is not interrupted.

The phosphoric acid compounds also enable us to give the skin a medium pH-value so that it cannot be easily unbalanced by perspiration, either. It is not difficult to manufacture preparations of a pH about 6.

As the chemical denomination, because of the length of the words, would be impractical for purposes of selling, Farbwerke Hoechst AG.* have prepared a simple code concerning the system which then can be easily kept in mind.

The Hostaphat brands have been named according to a system derived from their constitution. The general formula for this is:

Hostaphat KR XYZ

The letter "K" means cosmetics as the field of application. Brands which are offered for other purposes, for instance, in the textile industry, do not

*Carbic-Hoechst Corp., 451 Washington St., New York City.



● EMULSIFIERS

● DETERGENTS

● ABSORPTION BASES

● FRAGRANCES

● SCIENTIFICALLY DEVELOPED
AND MANUFACTURED—
SPECIFICALLY FOR APPLICATION
IN COSMETIC FORMULATIONS



carry the letter "K". "R" stands for an alkyl or acyl group.

L = lauryl alcohol
W = wax alcohol
O = oleyl alcohol
S = stearic acid

"X" signifies the degree of esterification (primary, secondary, tertiary); "Y" the degree of oxethylation of the alkyl or acyl group; "Z" the number of molecules of ethylene oxide contained as polyglycol.

Fields of application

The following Hostaphat brands are suitable for the preparation of o/w emulsions:

Hostaphat KL 340 = Emulsifier 1
KL 240 = Emulsifier 2
KO 280 = Emulsifier 3
KW 340 = Emulsifier 4
KS 340 = Emulsifier 5
KW 200 = Emulsifier 6
KO 300 = Emulsifier 7

Of these brands, especially suitable for the emulsification of mineral oil are:

Emulsifier 1
Emulsifier 2
Emulsifier 3
Emulsifier 4

for that of petrolatum, hard paraffin and ceresin:

Emulsifier 4 & 6.

for fatty acid esters such as isopropyl palmitate:

Emulsifiers 1, 2, 3, 5.

Fatty alcohols and fatty acids can practically be emulsified with all O/W emulsifiers of the Hostaphat group.

For W/O emulsions Emulsifier 7 is suitable.

The following examples may give a short review of the possibilities of using the Hostaphat brands:

Vanishing cream

Emulsifier 4	10.3%
Stearin (3-fold pressed)	14.4%
Lanolin USP	3.1%
Spermaceti	2.1%
Perhydrosqualene	2.1%
Water	68.0%

Weakly greasing cream

Emulsifier 4	14.0%
U.S.P. Mineral oil	30.0%
Water	56.0%

Liquid emulsion

Emulsifier 1	9.8%
U.S.P. Mineral oil	14.7%
Lanolin USP	1.0%
Petrolatum (white) USP	2.0%
Water	72.5%

Cream of high alcohol content (after shaving cream)

Emulsifier 5	2.4%
Fatty alcohols C ₁₆ -C ₂₀	9.6%
Perhydrosqualene	2.0%
Water	44.0%
emulsify, homogenize, and stir ethyl alcohol into the mixture.	42.0%

Pitfalls in commercial chemical development

Reprinted from Vol. 52, page 13, January, 1960, *Industrial and Engineering Chemistry*. Copyright 1960 by the American Chemical Society and reprinted by permission of the copyright owner.

by William E. Strevig
Continental Oil Company

The articles in this group describe chemical development projects drawn from actual experience. They have one unique feature which distinguishes them from other such descriptions—they emphasize pitfalls rather than successes. The experts who prepared these articles did so in the conviction that, by examining our past experience critically, we may glean some truths that will make future development efforts more productive.

Development is used in its broadest sense, and includes any process by which new dimensions are added to a company's operations—acquisition, license, or innovation of new products. *Pitfall* refers to any unanticipated event which, by itself, may seriously impede or totally block the development process.

To define the term "pitfall" further, we may draw a crude analogy between the development process and the operations which take place in a chemical plant. The analogy may be conveniently set out as:

Physical Chemical Process	Development Process
Assembling of raw materials	Marshaling of people, production facilities, and marketing organization
Introduction of catalysts	Exploitation of skills and the backlog of experience and ideas
Distillation	Separation of masses of alternative projects to define them more clearly to facilitate selection
Mixing	Close coordination of many diverse activities
Recording and control	Continuous evaluation of progress and likelihood of success

The desired result in either side is to turn out a product that meets previously determined specifications. With chemical processes we think in terms of physical and chemical properties. In the case of the development process we think in terms of the size and timing of financial return on investment.

Causes of Failure

Pitfalls are elements which cause failure to meet specifications. There are pitfalls lurking in both sides of the analogy. In chemical processing, pitfalls take such forms as:

1. Selection of the wrong materials and/or catalysts

2. Producing of cuts in distillation that are too wide or too narrow

3. Incomplete reaction because of inadequate control

In the development process, pitfalls take the form of:

1. Undertaking projects for which the organization is not equipped

2. Failure to exploit fully the creative ability of people

3. Improper timing of laboratory research and customer evaluation of products

4. Unwillingness to evaluate projects objectively

Failure in any one of the key elements of either chemical processing or the development process will result in failure to meet specifications on time. In either process, the consequences of failure can be disastrous in terms of financial loss and impairment of morale.

In these case studies, our attention is focused on examples of pitfalls which caused, or might have caused, failure of a development project. This approach is of value as an antidote to the many successful projects described in the literature which tend to obscure some of the basic problems in development work.

The cases cover a wide variety of products. They include a resin hardener, an organic acid intermediate, an inorganic blowing agent, a petroleum-derived fatty acid, a pharmaceutical for treatment of tuberculosis, and ion exchange resins. Also included is a discussion of one company's basic policy decision on product planning.

The projects described differ in the extent to which they were carried out. Two of the projects reached commercial production. One got only as far as semi-commercial production, and three were dropped in the experimental state. In all cases, however, substantial investments were made before the pitfalls were discovered.

All of the articles presented here suggest the question "How can the pitfalls be avoided?" Ideally, of course, we would like to eliminate them entirely. Practically, the best that we can do is minimize the chances that they will occur.

To return briefly to our analogy, risk from pitfalls in the construction and operation of chemical plants is minimized by careful design of the process. Engineers select and arrange all of the elements of the plant on the basis of elaborate, detailed data. Does it not seem reasonable that this same approach should be applied to the development process? The following articles attest to the profitable value of designing development projects as carefully as we design chemical plants.



PACKAGING & PROMOTION

1—Ellena

Ellena, a division of Drug Research Corporation, has introduced "Miss Mantan" as the first moisturizing tan-without-sun foundation cream. The product develops a tan within 4 to 6 hours and at the same time moisturizes and smooths out the complexion. It is being promoted as an effective night cream and as a foundation base for make-up. Two and four-ounce jars of "Miss Mantan" will be marketed and an extensive advertising schedule in fashion magazines and local newspapers will back-up the introduction.



1

2—Alexandra de Markoff

Alexandra de Markoff has introduced a clear, multiple oil, concentrate for nighttime moisturizing and lubrication called Nylressi Plus. The product is being distributed during the month of July and extensive plans have been made for its introduction to consumers. A two-ounce bottle will retail at \$10.00 and the four-ounce bottle will retail at \$17.50.



2

3—Shulton

Shulton is marketing a newly developed hair conditioner packaged in a clear glass, flask-shaped bottle cartoned in bright red. The hair tonic is being promoted as a clear, non-staining liquid, containing no grease, cream or oil, which moisturizes the scalp to prevent dryness and effectively control dandruff. This product adds another year-round item to the company's Old Spice line and three to four repeat sales a year are expected on this unit.



3

4—Helena Rubinstein

Helena Rubinstein has introduced a rinse which is specifically designed to color and blend mixed gray hair. Called "Color Lift Coverinse" the product is marketed in one-ounce bottles containing enough rinse for one application which is claimed to last through five shampoos. Coverinse can be used on permanented and tinted hair but not on bleached hair. It is not designed for hair without gray.



4



5



6

5—Helene Curtis

Helene Curtis has introduced the first feminine shave-cream for women who use a blade type razor for legs and underarms. The product is packaged in a pink aerosol container decorated with roses. Called "Plush", the shave-cream is greaseless and delicately antiseptic. Advertising in fashion magazines during July will introduce "Plush" and all promotion will evolve around the pink feather which is the symbol of the product's softening action on the skin.

6—Max Factor

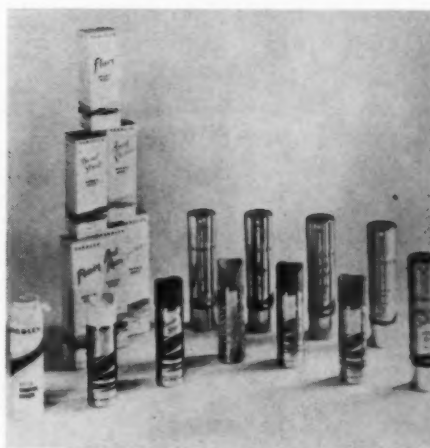
Max Factor has announced that its "Sheer Genius" make-up, which will be introduced in October, embodies a completely new concept in make-up. This liquid make-up is intended to give a complete make-up and is not a foundation and does not require use of face powder or compact powder. The product is not comparable with Max Factor's other make-ups (Pan-Cake, Pan-Stik, Creme Puff and Hi-Fi Fluid). Packaged in a tube "Sheer Genius" will be marketed in eight fashion shades.

7—Yardley

Yardley of London, Inc. has begun packaging their toilet water products in aluminum aerosol containers. Available in four-ounce and 2¼-ounce containers are Flair, Lavender, Red Roses, April Violets and Bond Street spray mists. The four-ounce size has a self-locking metal top and the 2¼-ounce container has a plastic cap with a specially tapered concave saddle for improved finger-tip control.

8—Nutress Laboratories

Nutress Laboratories of North Hollywood, California has introduced Proteinail a high potency organic protein food designed to strengthen nails and soften cuticles in polyethylene tubes. The 1½-ounce tubes have an oversize "stand-on" cap and the white package is overprinted in grey and pink. A dozen units are contained in a point-of-purchase display and single units in a folding display stand carry out the same theme as the larger display.



7



8

Society of Cosmetic Chemists

Abstracts of the papers given at the spring meeting

"Assay Of Lyophilized Human Placenta Extract"

William Colburn, Ph.D. President, Colburn Laboratories, Inc.

An assay method, based on the alkaline phosphatase enzyme activity, is presented, together with a critical evaluation of the effects of all the variables involved. The influence on the assay results of various preservatives, solvents, antioxidants, cosmetic ingredients, and processing conditions is included in the paper.

"Effect Of Vehicle Components And Sebum Constituents On The Absorption Characteristics Of Sunscreens"

S. Riegelman and R. P. Penna, University of California School of Pharmacy

The Ultraviolet absorption property of a chemical is the critical property for the selection of a cosmetic sun screen. In 1952 Kumler proposed a simple method of evaluating the relative screening action of sun screening compounds. Utilizing propylene glycol and ethanol solutions of the compounds he defined the sunscreen index as the optical density at 3080 angstroms of a 1.0 per cent in a 0.1 mm path length. However, the solvent has an important effect on these results since the dielectric constant and hydrogen bonding properties of the solvent have a profound effect on the polarizability of the sunscreen and therefore on its ultraviolet absorption properties.

An investigation was undertaken to clarify these effects by studying several of the molecules typical of the chemical types used as sunscreens. The U. V. absorption spectra were recorded in ethanol, water, isopropyl palmitate, liquid petrolatum, in the presence of humectants and surfactants. It was found that the spectra of several of the para-amino benzoate types are particularly affected by solvent environment. Other classes of sunscreens were significantly modified in their absorption properties.

The effect of sebum and sweat constituents are reported and the results are discussed in the relation to the proposed residual skin environment.

"Molecular Forces In Permanent Waving"

Mr. Herman Bogaty, Associate Research Director, The Toni Company

Because present practice in permanent waving employs chemical agents which react with the disulfide of keratin, it is common for research in waving to focus on the role of these bonds in hair. Emphasis is given in this paper to the part that secondary bonds in keratin play in the waving process. Agents that promote hydrogen bond rupture can enhance the waving action of mercaptans or, under special circumstances, can wave in the absence of reducing

agents. Salts which increase the hydrogen bonding in hair tend to depress the waving activity of mercaptans.

The stabilization of curls, produced by waving of reduced hair, can be effected without re-oxidation of disulfide cross-links by allowing sufficient time for the formation of hydrogen bonded cross-links. In this respect, reduced keratin behaves in a manner similar to many synthetic fiber polymers which can be set despite the absence of covalent cross-links in their molecular structure.

"The Pathogenesis Of Alopecia"

Norman Orentreich, M. D., New York City

This paper covers the following areas: 1. The causes of hair loss in men. 2. The causes of hair loss in women. 3. Review of steroids, and transplantation techniques, etc. in the study and treatment of alopecia problems. 4. Influence of cosmetics on hair loss.

"Non-Aqueous Foam Propulsion Systems"

Mr. David S. Tillotson, Group Leader Isotron Products Technical Service Laboratory, Pennsalt Chemicals Corporation

The art of preparing aerosol foams has relied on solubility limits of propellants in water. We will show how entirely water-free foams may be prepared.

The advantages of water-free foams are increased stability of ingredients normally sensitive to water, low temperature stability, lower package volume, wider range of propellant usage, and longer package life.

The practical limits of these systems are only solubility and viscosity. A range of materials heretofore unacceptable to aerosol packaging is therefore described as applicable in these systems.

The products include anti-perspirants, depilatories, pharmaceutical dispersions, cleansers, plastics and others.

The wide range of propellants includes fluorochlorohydrocarbon, hydrocarbon, compressed and soluble compressed gases and combinations of these propellants.

Suggested applications include internal and external pharmaceutical and hygienic products. Controlled dosage forms call for valve design and container modifications. Long term application studies and increased package use are projected. Patent applications have been made on these systems.

"The Use Of Ternary Diagrams In Cosmetic Formulation"

Robert James & Robert L. Goldemberg, Shulton, Inc.

The efficiency of a research program depends on

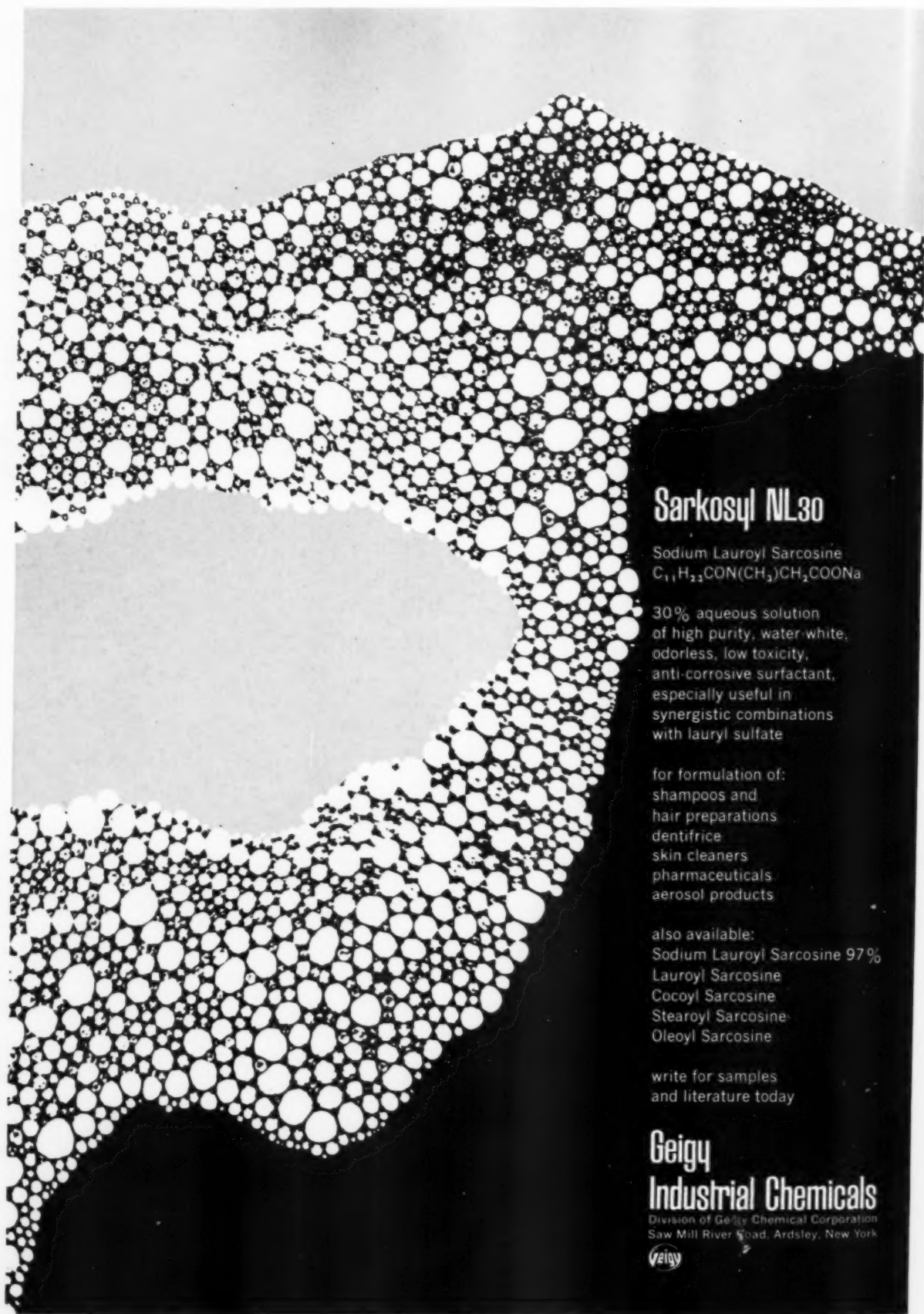


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Sarkosyl NL30

Sodium Lauroyl Sarcosine
 $C_{11}H_{23}CON(CH_3)CH_2COONa$

30% aqueous solution
of high purity, water white,
odorless, low toxicity,
anti-corrosive surfactant,
especially useful in
synergistic combinations
with lauryl sulfate

for formulation of:
shampoos and
hair preparations
dentifrice
skin cleaners
pharmaceuticals
aerosol products

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Sodium Lauroyl Sarcosine 97%
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the extent to which all work done is purposeful and leads to the desired goal with a minimum of random effort. This paper offers a logical approach towards fulfilling these requirements through the use of ternary diagrams combined with the concept of "parallel" and "crossed" series of experiments.

The basis of the approach is the fact that each new series of experiments may be related to previous ones in two ways: they may be paralleled or they may be crossed. During the initial stages of an investigation the use of "crossed series" of experiments will quickly define the area in which the most desirable formulas may be found. When this area has been defined, a single set of "paralleled series" will usually spot the single most desirable formula.

Combining this concept of crossed and paralleled series of experiments with the use of ternary diagrams to record data reduced the number of samples required to obtain desired information. This is true because the ternary diagram can demonstrate three variables simultaneously in a way that a fourth variable can usually be estimated. The result is that information is condensed into less space, affording the formulator a clearer understanding of the system under investigation.

Non-irritant depilatories

By T. A. Ruemele, PH.D.

Reprinted from *MANUFACTURING CHEMIST*, February 1959. The Leonard Hill Technical Group, Leonard Hill House, Eden Street, London, N.W. 1.

Thioglycollate depilatories are more acceptable products than the older sulphide hair removers. But even these, like all depilatories, tend to irritate the skin, depending on the sensitivity of the individual. Hence the warning that depilating treatment should be stopped immediately at the slightest sign of irritation. It is partly because of this that depilatories are used predominantly on the legs and arms and generally are not recommended for the face, although there are a few products that are claimed to be suitable for use on the face, provided a soothing cream is used afterwards.

Recently two suggestions were put forward for minimising the irritant property of depilatories. In both cases an antiseptic is incorporated in the depilatory, namely 8-hydroxyquinoline sulphate and hexachlorophene (German Pat. 965,920 1958 and U. S. Pat. 2,823,168 1958 respectively). The former antiseptic is incorporated in a sulphide preparation (strontium sulphide), the latter in a calcium thioglycollate depilatory, said to be specially suitable for pre-operative purposes.

The skin may benefit from the use of antiseptics, but whether they can prevent allergic reaction has yet to be ascertained.

Investigating this problem the present writer felt that to eliminate the irritant from depilatories an anti-allergy agent should be incorporated. 1,4 Dimethyl-7-isopropyl azulene ($C_{15}H_{18}$), the blue colouring matter of chamomile, is recognised for its antiphlogistic, regenerative and anti-allergic activity, so it was decided to employ it as the anti-irritant (Patent appl.) and subject it to stringent tests by incorporating it in a powerful depilatory formula which, because of its strength, alkalinity and consequently very quick action, would normally produce extensive irritation on sensitive skins, e.g.

	%
Reducing chemical	7.0
Alkaline chemical	9.9
Emulsifier	15.0
Azulene	0.25
Water	67.85

Clinical tests included depilating treatment of the legs and arms and even on fairly long exposure no irritation occurred. Subsequently, over a hundred tests were carried out on the face, again without signs of irritation. Several of the subjects in this test had previously experienced irritation from the use of a depilatory. Finally, tests were made with a deodorant, which was applied to the skin immediately after the depilating treatment, a procedure strongly deprecated in the normal way. Here too, no adverse effect was produced.

These results indicate that azulene makes depilatories safer to use and, because stronger formulations may be employed, quicker in their action.

The writer is indebted to the directors of Pharmax Ltd. for the permission to publish this note, and thanks Dr. G. E. Hesketh, medical consultant to the firm, for the performance and assessment of the clinical tests.

Topically applied hormones

Dear Editor:

I believe it may be worthwhile to point out to the readers of the *American Perfumer* a principle of dermatology involving the use of topically applied hormones.

The physiological effect of estrogen is not identical to that of estrogen-progesterone combination when applied to the skin. For example, estrogen and progesterone are antagonistic in their action on the sebaceous glands; estrogenic hormones inhibit and cause involution of the sebaceous glands, whereas progestational hormones stimulate and cause hypertrophy of the sebaceous glands. In other respects these hormones are synergistic. Thus, this subject can not be disposed of too briefly, and much research remains to be done.

I am anticipating, with keen interest, future reports concerning the application of endocrine preparations in dermatology and trust that more contributions will be forthcoming from your readers.

Robert Liefmann, M.D.
Dermal Research
Montreal, Que., Canada

Radioisotopes in the Pharmaceutical industry

Abstracts of papers presented at a symposium at
Purdue University, April 25-26, 1960

Why Radioisotopes—A Technical Economic Evaluation

*Stephen P. Cobb, Jr., Committee Executive
Nuclear Energy Committee, National Association of
Manufacturers*

Radioisotopes are being used by an increasing number of industries throughout the country and such utilization is resulting in the saving of considerable sums of money. Nevertheless, there are a number of factors which company executives unfamiliar with these materials, must take into account when planning to use isotopes for the first time.

Economic savings may be affected through use of radioisotopes either in research or in process control, although the dollar value of the savings may be more difficult to determine in a research program. In either case, technical evaluation of their use would be similar.

A non-technical company executive needs the answer to the following questions, among others: What properties of the new product make it desirable from the customer's point of view? What properties make it undesirable? Is the process using the radioisotope safe? Can it be handled by the normal labor force?

What maintenance problems are likely to be encountered, especially if the radioisotope provides for automation? What are the costs, since the radioisotope will entail additional expenses? What is the patent situation? What problems are raised by AEC or state regulations? What are transportation costs likely to be? What are the long range plans of the company and how does the research department fit into those plans?

For proper technical evaluation of any technological development, including radioisotope use, the following points should be observed:

1. There must be a definite, well-considered plan for the future. Knowing what is needed, management must provide adequate information for the research or technical department to perform its job effectively.

2. There must be competent technical economic evaluation of company operations. The evaluators may be employees of the company, but more likely

they will be a group of persons with diversified knowledge from an outside firm. They will gather facts, make diverse studies, analyze data then give pros and cons to top management, who has the responsibility for decision making.

3. Successful companies in these days of technological progress have a Technical Director who has equal status with vice presidents of sale, finance, production and general counsel. The Technical Director is not a Director of Research as commonly understood; rather he is a technical economist familiar with other activities of the company. The Technical Director actively participates in company management decision.

With these three conditions satisfied, management will be in a position to answer intelligently the key question of all business: "Where and how can we get the most profit from our investment dollar?" This is the ultimate aim of business to which all other questions must be brought into focus.

Radiation Sterilization In The Pharmaceutical and Allied Industries

*Charles Artandi, Associate Director of Research,
Ethicon, Inc.*

The Pharmaceutical Industry has been in need of a method of sterilization of proteins, enzymes, steroids and other sensitive materials which does not involve heat or very reactive chemicals. Ionizing radiation can successfully be used to destroy microorganisms at doses which are harmless to most of these compounds.

This new method of sterilization has three important advantages: 1. The final sealed package can be sterilized 2. New, less expensive and more convenient packaging materials may be used (plastics) 3. Easy adaptability for continuous process.

Electron accelerators (Van de Graaff electrostatic or Linear accelerators) should be the preferred sources of radiation, whenever penetration of the product is no problem. Gamma emitters and x-ray machines provide great penetrating power, but their dose rate

is low and good utilization of energy requires complex engineering designs due to the problems of geometry.

Electron accelerators have high power output; the beam can be scanned to cover the conveyORIZED product. A sterilizing dose is delivered in a second or less. The accelerators can be turned off when not in use; repairs and maintenance can be done safely.

If the penetration is not adequate, several approaches can be tried, like: 1. Redesigning the package 2. Accelerator of higher energy 3. Irradiation from two sides if the product permits.

The performance of the machines can be routinely checked by meters, monitors and recorders. Various dosimetry systems are available for the calibration of machine performance and spot check of production.

Irradiation is not economical for products which can be sterilized by heat. Its higher cost, however, is only of secondary importance when a quick and efficient method is needed for sterilizing sensitive materials.

Sutures of all kinds, dressings, ointments, enzymes, injectibles and other items are being sterilized on production scale by irradiation, and the field is open for many more products.

Radiation Safety: Responsibilities of Management

*B. G. Dunavant, Assistant Professor of Health Physics
Purdue University*

Early in an industrial radioisotope program management should establish a radiological control program to maintain accepted radiation safety practices within their laboratories.

As the industrial utilization of radioisotopes and other sources of ionizing radiation increases, there is also an increased need for assuring employees and citizens in the community that these materials and devices are being used in such a manner that assures safety to all.

Analytical Applications of Radioisotopes, Present and Future

*Benjamin F. Scott, Chief Chemist,
Nuclear Chicago Corporation*

The ways in which analytical chemists use radioisotopes are: isotope dilution, extent of reaction analysis, end of reaction analysis and the evaluation and development of analyses. Isotope dilution and extent of reaction analysis are promising for industrial process control for both automatic and laboratory methods because of their specificity, convenience, linearity, and ease of converting to an electrical signal. End of reaction analyses using radioisotopes show promise for automatic process control of the go-no go type.

Radioisotope Laboratory Design, Instruments, and Cost

*Philip Shevick, Chief-Engineer,
Nuclear-Chicago Corporation*

New groups starting a research program using

isotopes have a huge backlog of knowledge and a large choice of off-the-shelf instruments to start with. Many of the basic physical problems have been solved. How these solutions can be used to solve particular problems in the pharmaceutical industry remains as the challenge. It is always the combination of those with skill in one field and the ability to use techniques from others that have made the practical advances.

The important steps in setting up an isotope laboratory are: a. Theoretical understanding of the problems to be solved. Clear-cut definition of the scope of the work to be performed. b. Careful review of the literature. c. Consultation with experts in the particular field. d. Laboratory visits to grasp the practical nature of the problems encountered. e. Discussion with manufacturers of reputable isotope laboratory equipment.

About this point one should begin to estimate what the research program will obligate the organization in terms of time, space, manpower and equipment. Despite the careful preparation described above one must allow for learning time in the trial and error process which inevitably follows. The so-called isotope laboratory can be anything from a wing of an entire building to a small bench in the corner of the lab. If one is not dealing with research on humans, the acquisition, storage and use of the isotope material can be quite simple and easily learned. Experience has shown that the major problems are development of sound experimental techniques, proper use and understanding of the instrumentation in-



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involved, and the interpretation and reduction of the data. An understanding of some radiation physics, nuclear electronics and the statistical nature of the counting data obtained are essential to good research. An example will be given to illustrate the nature of these problems in a specific isotope counting problem.

The presentation will discuss laboratory and instrumental design problems for various specific isotope applications. The use of automatic equipment for its labor saving advantages will be discussed. The presentation will conclude with a summary of the newer developments in the isotope instrumentation field.

Uses of Radioisotopes in the Pharmaceutical Industry: First Report of New Potential Applications

*William F. Bousquet, Assistant Professor,
Bionucleonics Department, Purdue University*

During the past year the Purdue Research Foundation under contract with the Office of Isotopes Development, U. S. Atomic Energy Commission, has conducted a survey of the present and potential uses of radioactivity in the pharmaceutical industry.

Particular emphasis in the survey was placed upon the identification of those areas in pharmaceutical research, production, process control and packaging operations which are especially well suited to the use of isotope techniques, procedures and controls.

This study has indicated that the larger pharmaceutical companies are very active in the use of radioisotopes in research, particularly in biochemical and pharmacological investigations. The scope of this type of activity in the industry as a whole is limited at the present time, but is expected to broaden significantly within the next two years as indicated by questionnaire replies. It is apparent that the industry has not been fully aware of the potential usefulness of radioisotopes in areas other than research.

Radioisotopes have found extensive use in studies of drug distribution, excretion and metabolism. It may be expected that the use of isotope and nuclear control procedures for product evaluation, thickness and density measurement and control, moisture measurement and control, and the use of large radiation sources for sterilization and static charge elimination will soon develop.

General Industrial Applications of Radioisotopes

Oscar M. Bizzell, Chief, Isotopes Technology Development Branch.

Radioisotopes in industry are proving their daily value in new and wider applications, contributing both direct and indirect benefits to the public as well as to industry. Our economy thrives on improved efficiency and increased productivity which isotopes can so signally assist. For industry, isotopes have become a potent factor in competition in terms of both quality and production costs.

Radioisotopes are used in nuclear gages to measure the thickness of materials produced by coating, rolling, bonding, and extrusion operations. Density gages using isotopes as sources of penetrating radiation

measure mass flow of chemical solutions, cement slurries, and petroleum products. Radiography permits industry to "see" into its products, insuring that the ever tightening specifications of modern technology are fully met. Isotopic tracers in research analyze and improve complex industrial operations.

Greater mechanization of factories through the use of isotopic gages and tracers has started. Complete automation for many plants may become possible through development of ultra-sensitive radiation detection instruments for use with very low levels of radioactive materials.

In addition to the use of fission products as separated radioisotopes in the more ordinary industrial applications, bulk quantities may be used to generate electricity. Several types of small batteries already have been designed and marketed. A thermocouple type currently is being developed to power a special weather station to operate unattended for several years in remote regions.

Other important applications of radioisotopes are in unfailing light sources, static elimination devices, electron tubes, smog analyzers, etc.

Despite the large rewards that radioisotopes already have yielded to technological and economic advances, it is apparent that only the surface has been scratched. Analysis of the situation indicates that a multitude of less obvious applications await research and development.

A joint program of research and development by industry and the AEC is viewed as a realistic approach to accelerated realization of the many benefits that radioisotopes hold. Through the Isotopes Development Program, the AEC is developing new radioisotope methods, techniques and proof-of-principle devices. Product engineering and development based on this new technology is left to private resources.

Application of Radioisotopes to Trace Level Research

Herbert Sheppard, Associate Director, Biochemical Pharmacology, Ciba Pharmaceutical Products

With the disintegration of unstable nuclei characteristic of radioactive isotopes there may be emitted α -particles (helium nuclei), β -particles (electrons) and γ -rays. While all of these induce ionization in matter making detection possible and sensitive only the beta and gamma emitters are of interest for biological trace level studies. The work to be described involved the use of carbon-14 and hydrogen-3 (tritium) both of which emit very weak energy β -particles.

The initial studies described concerned themselves with the distribution, excretion and metabolism of reserpine and the possible relationship of tissue concentration to pharmacological action. Stepwise improvement in counting procedures increased the sensitivity of the analysis and yielded more information. The introduction of C^{14} and tritium into different parts of the molecule permitted a more complete evaluation of the distribution studies. The results led to the conclusion that the pharmacological effects of reserpine could not be correlated with drug concentration.

Studies with the diuretic hydrochlorothiazide, specifically labelled with tritium, permitted one to correlate drug action with tissue concentration. It was learned that the drug was absorbed rapidly and was excreted essentially unchanged.

Continued interest in renal function led to a study of localization of labelled steroids in areas of the kidney. It was demonstrated by radioautography that both desoxycorticosterone-4-C¹⁴ and aldosterone-H³ concentrated in the outer medullary region. Here is located the thick portion of the rising loop of henle which appears to be involved in the reabsorption of sodium. Examination of the distribution of aldosterone-H³ demonstrated that the tissue with the greatest concentration of radioactivity was the pituitary gland followed by the caecum and liver. Little or no free aldosterone could be identified in any of the tissue extracts examined.

The interest in steroids extended to the area of adrenocorticosteroid biosynthesis where a joint endeavor uncovered a compound Su-4885 which in practice behaved as a selective inhibitor of 11-beta-hydroxylation. Examination of corticosteroid biosynthesis from labelled precursors demonstrated that the inhibition could be explained on the basis of an inhibition of glucose utilization.

Thus it may be concluded that radioactive isotopes serve as an invaluable tool in studies concerned with the distribution, excretion and metabolism of drugs and hormones. In addition they permit the examination of the effect of drugs on systems of metabolism.

Radiation Safety: Training, Facilities, and Instrumentation Considerations

Paul L. Ziemer, Radiological Control Officer, Purdue University

In considering radiation safety, the primary concern is always the protection of personnel from potential and existing radiation hazards. The secondary concern is the protection of equipment and facilities.

The best general protection in all instances is proper training. Training of personnel in radiation safety is thus the basic essential for a successful and safe program involving radioisotopes. Individuals working directly with the materials must be trained in the proper techniques of handling the materials and must be trained to recognize potential hazards. Other plant personnel, indirectly associated with the radioactive materials, should be given basic instructions and training in order to reduce unnecessary fears and tensions and to prevent panic in an emergency.

Facilities need not be expensive or elaborate, but must meet certain essential requirements. Proper hoods, sinks, floors, and similar facilities will be considered from a Radiological safety or health physics point of view.

Instrumentation for monitoring both personnel and equipment is very necessary to prevent overexposure and contamination. Instrument considerations will depend on the type and amount of material to be used. Film badges, pocket dosimeters, and survey meters will be discussed as to their applications, usefulness, and relative cost.

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INTERNATIONAL ENCYCLOPEDIA OF COSMETIC MATERIAL TRADE NAMES. By Maison G. deNavarre, brings you reference data you will turn to constantly . . . the most complete listing of all the materials of the world used in cosmetic manufacture . . . including quick concise descriptions of approximately 4,000 materials . . . the names and addresses of the suppliers . . . and a very useful cross-index of the materials and their uses. You will use it when seeking new materials, or substitutes for those you may now be using. 400 pages. Price \$7.50.

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Jean Despres

Jean Despres new TGA president

Jean Despres, executive vice president of Coty, Inc., was elected president of the Toilet Goods Association at the 25th annual convention held recently at Poland Springs, Maine. Vice presidents are George L. Schultz, Shulton, Inc., Oscar Kolin, Helena Rubinstein, Inc., J. I. Poses, D'Orsay Sales Co., and D. H. Williams, Sterling Drug, Inc. Association treasurer is Philip C. Smith, Yardley of London, Inc. and William F. Denney, Jr., Frances Denney, is secretary.

Directors of the Association are: Edward J. Breck, John H. Breck, Inc., Paul J. Carey, Tussy Cosmetics, Lessing L. Kole, Kolmar Laboratories, Inc., Jerome A. Straka, Chesebrough-Pond's, Inc., Northam Warren, Jr., Northam Warren Corp., Paul J. Martinot, Caron Corp., and Raymond Stetzer, Revlon, Inc. all filling three year terms expiring in 1963. Elected to fill vacancies in term expiring in 1962 were Hal Grafer, The J. B. Williams Co., Inc., and L. W. Schleuse, Texas Pharmacal Co. Directors representing associate members are J. S. Wiedhopf, Roure-Dupont, Inc. and Daniel H. Reheis, Reheis Company.

Revlon buys Realistic Company

Revlon, Inc. has acquired the Realistic Company whose products include shampoos, hair dressings, hair sprays, hair conditioners and professional beauty salon permanent waves.

Realistic will be operated as a wholly-owned subsidiary of Revlon. A purchase price of several million dollars in a combination of cash and stock was involved in the transaction. No changes in management or operations at either the headquarters in Cincinnati or Realistic's subsidiary plants in Oakville, Ontario, Mexico and the Philippines are contemplated at this time.

SCC 1960 European tour set

The European tour and conference of the Society of Cosmetic Chemists will begin on August 19th. The trip will include visits to nine European cities and will be highlighted by attendance at the First Congress of Cosmetic Chemistry of the International Federation of Societies of Cosmetic Chemists to be held in Munich. Societies in several cities are planning technical meetings and social functions for the touring group.

Information about the tour may be obtained from Samuel Cohen, Glyco Chemicals, 417 Fifth Avenue, New York 16, New York.

New aromatic research at Fleuroma

Dr. Jerome G. Kaufman, director of research, has announced that Fleuroma, Inc. has embarked on an accelerated program for the development of original aromatic synthetics. The application of the latest physico-chemical methods for the manufacture of natural isolates will also be intensified.

New aerosol filling line opened in L.A. plant

More than 750,000 units can be packaged by the new aerosol filling line opened recently by Par Industries, Los Angeles. Two additional bulk tanks for storage of propellant gases are part of this expansion program.

Obituary

Arthur H. Downey, vice president in charge of research and technology at Magnus, Mabee & Reynard, died on Monday, June 13th after a short illness. Mr. Downey was 62 years old and was an active member of the Institute of Food Technology and the Essential Oil Association of the U.S.A.



Dr. Thomas A. Dooley, co-founder of MEDICO, spoke to the annual June Ladies' Day Luncheon of the Cosmetic Industry Buyers & Suppliers Association. Dr. Dooley described the conditions under which the doctors work in primitive Laos and gave an explanation of the aims of MEDICO. Shown with Dr. Dooley (who is at the left) is Mrs. G. Sassano, his assistant, and Lamson Scovill, president of the CIBS.



International prize awarded to Dr. H. C. Friederich

Dr. H. C. Friederich, private consultant at the University of Tubingen, Germany, has been awarded the 1960 "Giuliana Brambilla" international prize for esthetics and cosmetology. The prize was established by Laserson and Sabetay Company of France as an acknowledgement of creativity in the field. Dr. Friederich has published more than one hundred works on allergy, cosmetology, dermatology and esthetic medicine. Previous prize winners were: 1957, George Dumont, Brussels, 1958, Dr. Paolo Rovesti, Milan, 1959, Louis Schmuck, Paris.

Lanolin manufacturers merge

The Malmstrom Chemical Corp. has acquired all the assets of N. I. Malmstrom & Co. of Brooklyn, New York. The Newark, New Jersey based firm will handle all office, marketing and research functions at the home office, 259 Parkhurst Street. The manufacturing unit will continue for the present at the Brooklyn plant. The merger will make Malmstrom Chemical Corp. one of the largest factors in the basic lanolin refining and lanolin specialties manufacturing industry.

Better Business Bureau issues warning on "tanning" preparations

The National Better Business Bureau has issued a warning to consumers against relying on skin "tanning" preparations to provide protection against sunburn. The Bureau has pointed out that unless the preparation contains a sunscreen agent the artificial tan will offer no resistance to the burning rays of the sun. Advising the consumer to use frequent applications of preparation which do contain sunscreen agents when the film is apt to be removed by swimming, perspiration, or friction such as rubbing with a towel, the Bureau takes an uncertain stand on simulated

tanning preparations in general, stating that the products work differently on different persons and that an uneven color or a yellow or orange color sometimes results.

Embassy Labs move to larger quarters

Embassy Laboratories, Inc., private label cosmetic manufacturer, has moved into enlarged quarters at 52-10 37th Street, Long Island City, New York. The move, which will triple Embassy's space, makes possible the inclusion of warehouse facilities for Embassy accounts. Access to the warehouse will be through bonded personnel giving the customer the advantage of a field warehouse without the cost of removing the merchandise and seeking to reach it to fill individual orders.

Perry Bros. names west coast representatives

Perry Bros., Inc., manufacturers of perfume bases, have announced that R. E. Flatow & Co., Inc. will represent their company on the west coast. Offices and warehouse facilities will be maintained at 10 Madison Street, Oakland, California and 2445 E. Hunter Street, Los Angeles, California.

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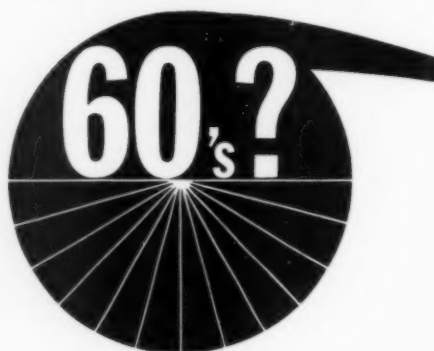
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BRANCHES THROUGHOUT THE WORLD





Robert A. Horsey, vice president of Givaudan-Delawanna, and president of the Essential Oil Association of the United States presents the Association's golf trophy to Jim Reardon, Roubechez, Inc.

S. B. Penick acquires majority interest in Canadian firm

S. B. Penick & Company, New York City, has acquired majority interest in Fine Chemicals of Canada Ltd., Toronto. Edwin G. Dentay, founder of the twenty-year old manufacturer of medicinal fine chemicals, botanical drug products and animal derivatives, will continue as head of the firm, and no other executive changes are anticipated.

Roberts Brothers purchase Pierce's Proprietaries

Pierce's Proprietaries, Inc., Buffalo, New York, has been purchased by Alfred and Bernard Roberts, owners of several other companies in the drug and cosmetic fields. The Pierce Company, a family-owned company that has been manufacturing proprietary medicines for over 85 years, is known for Doctor Pierce's Golden Medical Discovery and Doctor Pierce's Favorite Prescription.

Allied Chemical renews grant to St. John's University

A grant in aid of \$3,000 has been renewed by Allied Chemical's General Chemical Division to the College of Pharmacy, St. John's University, Jamaica, New York for the purpose of aerosol research for the year beginning September 1, 1960.

The program, which was initiated last year, is concerned with the solubility and stability of pharmaceuticals

in aerosols, and has been proceeding under the direction of Dr. John J. Sciarra, associate professor of pharmaceutical chemistry.

Seventh seminar of SCC planned for September

The 7th annual cosmetic seminar of the Society of Cosmetic Chemists will be held on September 15th at the Drake Hotel, Chicago, Illinois. The two day meeting will be divided into three topic sections: enzymes of the skin, hair coloring, and analysis of cosmetic mixtures.

Speakers on the topic "The Biodynamics of the Skin" will be Dr. R. K. Winkelmann, Mayo Clinic, Dr. R. A. Ellis, Brown University, and Dr. A. L. Lorincz, University of Chicago; the moderator will be Dr. Adolph Rostenberg, University of Illinois.

"The Coloring of Hair" will be covered by Dr. D. L. Underwood, The Toni Company, Dr. S. Becker, Illinois University and Whiting Clinic, Walter Edman, Evans Research & Development Corp., Gus Kass, Alberto Culver Co. and Louis Hoehn, Jr., Nianza Color & Chemical Co. The moderator will be Dr. R. C. Houtz, The Toni Company.

Dr. M. J. Rosen, Brooklyn College, Robert J. Manning, Beckman Instrument Co., and Dr. R. H. Marriott, County Laboratories, Ltd., England, will discuss aspects of "A New Era in the Analysis of Cosmetics." Panel moderator will be Dr. W. Colburn, Colburn Laboratories.

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Givaudan builds plant in Spain

Givaudan - Delawanna has announced plans for construction of a plant for the new addition to their international set-up Givaudan Iberica S.A. The factory will be located in San Celoni, Spain, about 35 miles from Barcelona and will be ready for production in about one year.

Teenage cosmetics to be marketed in Cincinnati store

The Di Mario Laboratories at 3347 Reading Road, Cincinnati plans to produce cosmetics under the brand name "Cor-Tre" to be marketed at Shillito's department store in Cincinnati, Ohio. Promoted as specially prepared for the teenage girl, "Cor-Tre" products were originated by Albert Burroughs, cosmetic manufacturer and Gino Di Mario, former advertising executive at Shillito's.

Belgian company to produce propylene derivatives

Solvay & Co., Brussels, Belgium will begin manufacture of allyl chloride, allyl alcohol and glycerol epichlorohydrin at their factory in Travaux, France. The main utilization of these three propylene derivatives are in perfumery, pharmaceuticals, plastics, plastics and laminated resins.

Paul J. Cardinal appointed chairman of DCAT convention

Paul J. Cardinal, vice president of Hoffmann-La Roche, Inc. was appointed general chairman of the 70th annual convention of the Drug, Chemical and Allied Trades Association which will be held at the Sagamore Hotel, Bolton Landing, New York, September 15th through 18th.

Risdon adds plastics division

Risdon Manufacturing Company, Naugatuck, Connecticut, has added a full-fledged plastics division to its operation. The division was established to serve the company's own need for plastic components for their aerosol valves but it will also produce for other companies. Started on an experimental basis two years ago, plastic production has progressed to a round-the-clock operation.

Private label company sold

Paris Cosmetics, Inc., Corona, L. I., New York, has been sold to Milton and M. Roy Spitalny. New officers of the organization will be Milton Spitalny, president, Julian Zielmann, vice president, M. Roy Spitalny, treasurer, Morton Daniels, technical director and Eric Adair, chief engineer. Plans are

in progress to add new equipment, triple space and increase research and development activities on new products in an effort to modernize this private label manufacturing operation.

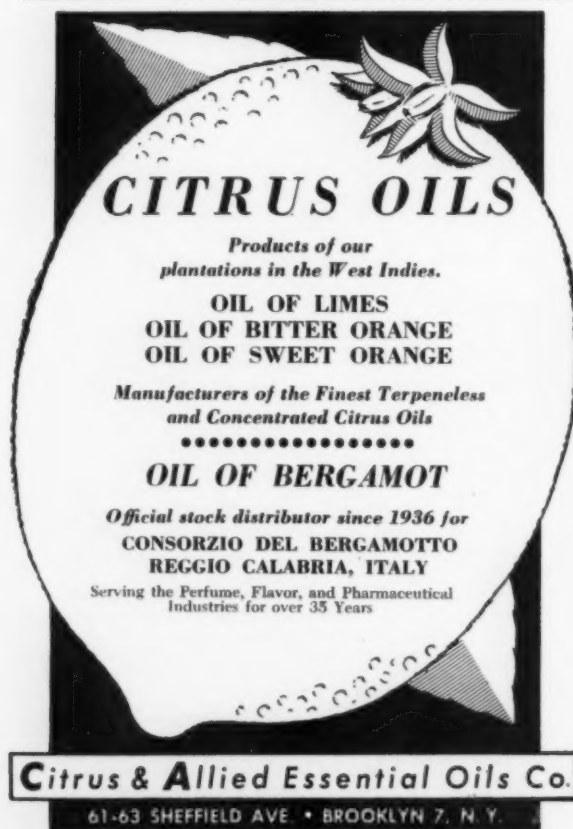
Richard M. Young has been appointed vice president in charge of sales of Ultra Chemical Works, Inc. Mr. Young, who joined Ultra in 1952, will be responsible for sales of all company products.

Dr. Carlo Giraudi has been named vice president in charge of Ultra's research, engineering and technical services staffs. Dr. Giraudi joined the company in 1950.

Travelers

M. G. Couderchet, president of Charabot & Co. recently visited the company's plant in Grasse, France, for discussion on plans for expansion of business in the United States.

Mr. Karen Dastakian, export manager of Parfums Marcel Rochas, was in New York recently for discussions with Howard Zagor, president of Rochas, on the introduction of a new fragrance "Madame Rochas" to be introduced in September. Mr. Dastakian and his wife continue their travels from New York to Mexico and South America.



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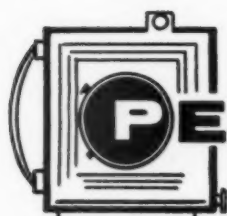


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PERSONALITIES

Irvin G. Knabel, Jr. has been elected vice president in charge of sales and promotion and Thomas M. Talley has been named vice president in charge of advertising of Realistic Company, now a wholly owned subsidiary of Revlon, Inc. Harold D. Baldrige is now executive vice president of the company and Carroll R. Reiss has been advanced to executive vice president of manufacturing, engineering and research.



Fred J. Fitzgerald

Fred J. Fitzgerald will fill the newly-created position of national sales manager for Yardley of London. His previous position of field sales manager will be filled by Donald J. Flannery.

Mr. Fitzgerald will be responsible for the coordination and direction of all sales activities of Yardley.

Alec J. Dedrick, Ernest Shiftan and Fred W. Webster all former vice presidents of van Ameringen-Haebler have been elected vice presidents of International Flavors & Fragrances (of which van Ameringen is now a division). Mr. Henri G. van Mameren, recently appointed general manager of the flavor division at Elizabeth, New Jersey was also elected a vice president of International Flavors & Fragrances.



Dr. Donald A. M. Mackay

Dr. Donald A. M. Mackay has been appointed director of research of Evans Research and Development Corporation, New York City. Dr. Mackay will direct and coordinate the technical activities of the research section of the Evans industrial research laboratory.

Eugene L. Barnett has been named technical director of Gene Rose Co., Inc., mid-western aerosol filling firm. Mr. Barnett will handle the firm's expansion of their research and development facilities.

Donald Roth has joined the Menen Company in their research and development laboratories. Mr. Roth was previously with International Flavors and Fragrances.

John A. Scharwath has been named sales promotion manager for the Fine Chemicals Division of Shulton, Inc. Prior to joining Shulton, Mr. Scharwath was with United States Rubber Company.

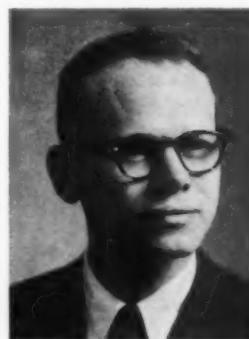
Dr. John Kapp Clark has been named director of research and development of Smith Kline & French Laboratories in Philadelphia. Dr. Clark will continue his affiliation with the University of Pennsylvania where he is an associate professor of medicine along with serving Smith Kline & French.

Robert L. Jenal was named to the newly-created position of plant manager for the St. Paul manufacturing division of The Toni Company, a division of the Gillette Company. Mr. Jenal joined the company in 1947 and has held several executive posts during the past thirteen years.

George F. Weber has been elected secretary of George Lueders & Co., Inc. Louis M. Allstadt has been elected assistant secretary and Joseph R. Dominica has joined the board of directors.

D. A. Persiani has been appointed field sales manager of The George W. Luft Company, manufacturers of Tangee products. Mr. Persiani has been regional sales manager covering the state of Pennsylvania for the past two years.

Alastair B. W. Anderson has been named product manager for the Old Spice for Men line of Shulton, Inc. Mr. Anderson joined Shulton in 1956 and was recently product manager for Bronztan and several other specialty products.



Eugene C. Judd

Eugene C. Judd has joined Coty, Inc. in the position of advertising director. Mr. Judd was formerly with Narragansett Brewing Company in a similar capacity.

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Wayne H. Fisher, Jr. has been elected president of the Owl Drug Company, wholly owned subsidiary of Rexall Drug and Chemical Co. Mr. Fisher joined the Rexall organization in 1947 and was most recently executive vice president of Owl.

Dr. R. L. Mayhew has been named to fill the newly-created position of technical coordinator, acetylene derivatives, surfactants and chemical specialties of the Dyestuff and Chemical Division of General Aniline & Film Corporation. Dr. J. L. Azorlosa will fill the company's newly-created post of program manager, exploratory polymer research; Dr. M. E. Chiddix has been named to the position of program manager, acetylene derivatives and chemical specialties research; Dr. S. A. Glickman was named assistant program manager,



Isaac B. Grainger

Isaac B. Grainger has been elected to the board of directors of Nichols Engineering & Research Corporation. Mr. Grainger has just completed a term as president of the New York Chamber of Commerce.

Dr. Ernest Guenther, vice president and technical director of Fritzsche Brothers, Inc., was elected president of the newly established Society for Economic Botany at the first annual meeting of the Society held during May at the Purdue Memorial Union, Purdue University, Lafayette, Indiana.

Dr. Guenther was also honored recently by the British Aromatic Compound Manufacturers' Association in London, England. A book entitled "The Living City: The City of London" inscribed with the names of the Executive Committee of the British Aromatic Compound Manufacturers' Association was presented to Dr. Guenther at a supper meeting of the Executive Committee.

Stewart Aledort and Dr. Salvatore J. Rand have been appointed to the Corporate Research and Development Department of the Colgate-Palmolive Company. Mrs. Emily J. Maitheny has been appointed to the analytical chemistry section of Colgate's Corporate Research and Development Department.



George dePasquale

George dePasquale has been named vice president in charge of marketing of Baird Chemical Industries, Inc., New York chemical manufacturers. Mr. dePasquale will be responsible for Baird's marketing programs in the paper, pharmaceutical, cosmetics, food products and rubber industries.



Dr. Henry Gribou

Dr. Henry G. Gribou has been appointed president of Dragoco, Inc., manufacturers of perfumes and flavors. For the past four years Dr. Gribou has been executive vice president of the company.

Samuel Kalish has been named design administrator of Yardley of London. In this capacity Mr. Kalish will be responsible for creativity and coordination of packaging and display designs and point of sale specialties.

American Perfumer & Aromatics

Technical digests

A Note On Coriander Of Commerce.

By Douglas C. Harrod.

(Digested from the *JOURNAL OF PHARMACY AND PHARMACOLOGY*, Volume XII, No. 4, April, 1960, p. 245)

It has been discovered that it is possible to divide the commercial varieties of coriander into at least three groups and, thus, identify their geographical origin.

In 1830, de Candolle distinguished two varieties of coriander according to the size of the fruits. *Coriandrum sativum* L. var. *vulgare* has a diameter of 3 to 5 mm. and that of *Coriandrum sativum* L. Var. *microcarpum* has a diameter of 1.5 to 3 mm. The former would include Moroccan or Mogadore coriander and the latter Russian coriander. The smaller fruits contained more essential oil than did the larger ones. The ultra violet absorption spectra of the oil and the emission spectra of the fruit ash help determine the geographical origin of the samples, but these methods are too involved. It was found that a method of counting the fruit and weighing it to obtain the number of fruits per gram allowed a suitable comparison of origins to be made.

An experiment was carried out using ten batches of a hundred fruits from each geographical sample. The samples were from Morocco, Mogadore, Germany, England, Roumania, Russia, etc. It was concluded that samples with less than seventy-five fruits per gram and showing purple patches on the surface of the fruit were Moroccan or Mogadore coriander. Samples between eighty and a hundred and ten fruits per gram are English or Roumanian coriander. Samples with over a hundred and thirty fruits per gram are German, Hungarian, Polish, or Russian coriander.

Dermatological Nomenclature.

By S. William Becker, M.S., M.D.

(digested from *A.M.A. ARCHIVES OF DERMATOLOGY*, Volume 80, December, 1959, No. 6. p. 178/778.)

Nomenclature is defined as "The system of names used in a particular branch of knowledge or art."* It has been found necessary to clarify and standardize the nomenclature in American dermatologic literature. *The Standard Nomenclature of Diseases and Operations* contains the best available dermatologic nomenclature. In order to facilitate the study of designations in this volume, a work-sheet was devised which was used by the members of a committee of the International Dermatological Congress whose task was to find some basis for organization. The work-sheet included:

- (1) The term.
- (2) Synonyms.
- (3) A definition.
- (4) Morphologic diagnosis.
- (5) Etiologic diagnosis.
- (6) Pathologic diagnosis.
- (7) Recommendations to the committee.

The source of all the woe is probably due to the fact

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that the etiology of many dermatoses are still unknown, and until the problem of etiology is settled, there will be no satisfactory classification and nomenclature.

One of the most confusing groups of diagnoses for the undergraduate student of medicine and the resident in dermatology rests upon the designation "dermatitis". The mature dermatologist eventually develops a list of diagnoses in this category which at least satisfies himself. The term "eczema" would be less confusing if its clinical picture consisted of erythema, edema, gross vesiculation, exudation, and crusting, which could be duplicated by the patch test application of the offending substance and the characteristic microscopic picture of spongiosis and vesiculation. The use of "seborrheic dermatitis" or "seborrheic eczema" has caused some concern. The former is an oily dermatitis and has been classed in the papulosquamous eruptions. Seborrheic eczema is a much less definite disorder characterized by involvement of various flexural regions. The term dermatitis medicamentosa is used for drug eruptions. Dermatologists call tumors such as benign neoplasms of the epidermis-seborrheic keratosis, while pathologists call them squamous papilloma. Pigmented nevi is well understood and thus its continuance is one that seems mandatory. A term such as juvenile melanoma should really be designated as pseudomelanomatous nevus since it has been seen in adult cases and is not malignant. Primelanomatous and early melanomatous tumors are called anything from "junction nevus" to "nevus lentigo".

It is agreed that nomenclature of disease is in a constant state of flux and that many more changes will doubtlessly be made.

Documentary credits

In the first Documentary Edition of *American Perfumer*, the company connections of three authors were inadvertently omitted. Francis E. Hutchins and Betty Tarnoff, authors of "Trends in household preparations with new germicides", are associated with the R. T. Vanderbilt Company. Willis J. Beach, author of "Waterless hand cleaners" is a chemist with the Sugar Beet Products Company.

Correction

In the report of the meeting of the American Society of Perfumers, Mr. E. S. Maurer was described as associated with Lautier Fils Ltd. Mr. Maurer left that firm somewhat over a year ago, and is presently Chief Perfumer to Messrs. Three Hands Products Ltd. of London.

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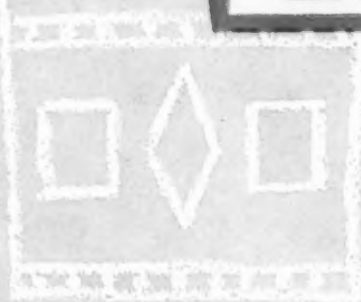
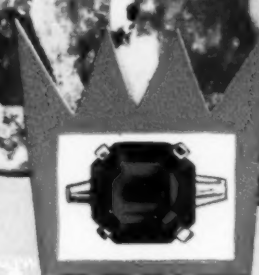
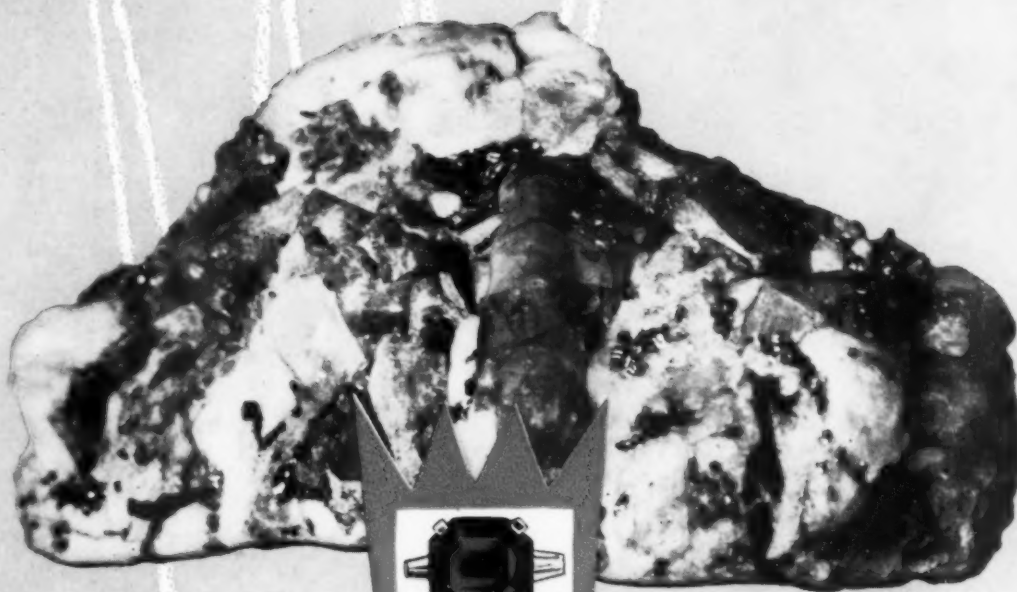
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Risdon Quality Valves
to Insure Customer-Keeping
Performance... Dispensing
Perfumes, Pharmaceuticals
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Refillable,
lipstick-size
dispenser holds
250 to 300
metered sprays.



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Refillable
container with
metered or
non-metered spray
valves in one
ounce and two
ounce stock sizes.



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For further information contact

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